National Aeronautics and Space Administration

NASA REAL PROPERTY ASSET MANAGEMENT PLAN

An Implementation Plan for Improved Asset Management

December 31, 2005

A Renewed Spirit of Discovery: The President's Vision For U.S. Space Exploration

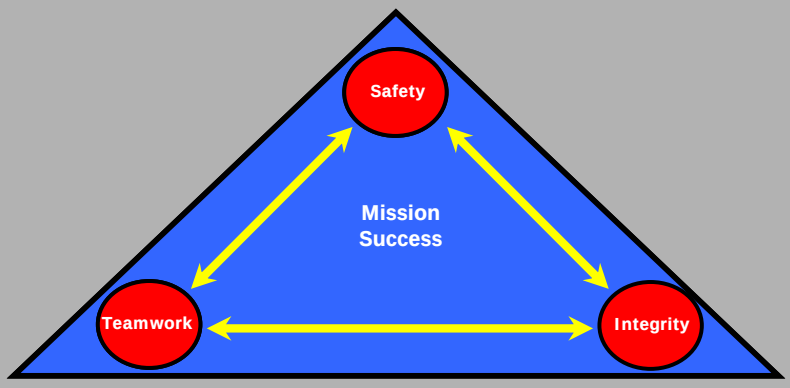
Goal and Objectives

The fundamental goal of this vision is to advance U.S. scientific, security, and economic interests through a robust space exploration program. In support of this goal, the United States will:

- Implement a sustained and affordable human and robotic program to explore the solar system and beyond;
- Promote international and commercial participation in exploration to further U.S. scientific, security, and economic interests;
- Develop the innovative technologies, knowledge, and infrastructures both to explore and to support decisions about the destinations for human exploration; and,
- Extend human presence across the solar system, starting with a human return to the Moon by the year 2020, in preparation for human exploration of Mars and other destinations.

NASA Core Values

NASA is dedicated to the values of Safety, Teamwork, Integrity and Mission Success. These shared core values express the ethics that guide our behavior. The Agency aspires to achieve these values in everything it does. NASA values:



Safety

NASA's constant attention to safety is the cornerstone upon which we build mission success. We are committed, individually and as a team, to protecting the safety and health of the public, our team members, and those assets that the Nation entrusts to us.

Teamwork

NASA's most powerful tool for achieving Mission Success is a multi-disciplinary team of competent people. The Agency will build high-performing teams that are committed to continuous learning, trust, and an openness to innovation and new ideas.

Integrity

NASA is committed to an environment of trust, built upon honesty, ethical behavior, respect and candor. Building trust through ethical conduct as individuals and as an organization is a necessary component of mission success.

Mission Success

NASA's reason for being is to conduct successful space missions on behalf of this Nation. We undertake missions to explore, discover, and learn. And we believe that mission success is the natural consequence of an uncompromising commitment to safety, teamwork, and integrity.

Message from the Assistant Administrator for Infrastructure and Administration

In January 2003, GAO designated Federal real property as a high-risk area due to long-standing problems with excess and underutilized property, deteriorating facilities, unreliable real property data, and costly space challenges. In February 2004, the President added the Federal Asset Management Initiative to the President's Management Agenda and signed Executive Order 13327, "Federal Real Property Asset Management." The order requires agencies to prioritize actions needed to improve the operational and financial management of the Agency's real property inventory.

NASA recognized the importance of real property management well before the GAO report and Executive Order, as evidenced by many of its real property initiatives and the development of its Real Property Management Plan, signed by the Administrator in November 2004. This document, the NASA's Real Property Asset Management Plan, is the final of a three-part foundation laid to promote efficient and economical use of its real property assets in accordance with Executive Order 13327 and the direction of the Federal Real Property Council. It will be updated as necessary to align with renewed Agency goals, values and management structure and to ensure compliance with Federal Real Property Council guidelines.

Real property is integral to achieving the *Vision for Space Exploration* "…to advance U.S. scientific, security, and economic interests through a robust space exploration program." Through excellence in real property management, NASA adds value to its programs and workforce by ensuring that its real property assets meet established goals. It also provides appropriate stewardship of these assets to achieve the best value for the American taxpayers' investment. NASA's real property goals and associated improvement initiatives for achieving excellence are defined in the Real Property Management Plan. The Asset Management Plan addresses how NASA will meet these goals and provides specific actions and timelines. NASA also developed a Real Property Business Plan in November 2004, which provides a roadmap for the improved utilization of all real property assets with potential for partnerships, leasing, or other innovative uses. Jointly, the Asset Management Plan, Real Property Management Plan, and Real Property Business Plan serve as the foundation for a systematic, comprehensive approach to excellent real property management.

I challenge you to strive for continual improvement in your stewardship of NASA's real property. We each have a valuable role to play in the management of these vital assets, as they are critical in returning human exploration to the Moon and then on to Mars and beyond.

Jeffrey E. Sutton
Assistant Administrator for Infrastructure and Administration and
NASA Senior Real Property Officer

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Section 1. Introduction

In conjunction with the NASA Real Property Management Plan and the Real Property Inventory, this is NASA's Real Property Asset Management Plan (AMP) as required by Executive Order (EO) 13327, "Federal Real Property Asset Management." This plan guides NASA in promoting efficient and economical use of federal real property[1] resources. In this plan, "asset," "constructed asset," and "facility" are often used interchangeably and generally refer to buildings, structures, and other improvements to land (including roads and utilities). NASA embraces the principles of the Federal Real Property Council (the Council) established by EO 13327. The Council's ten guiding principles, applicable to Federal real property asset management, include:

1. Support agency missions and strategic goals *(Reference Section 2).*
2. Use public and commercial benchmarks and best practices *(Section 2 and Appendix B).*
3. Employ life-cycle cost-benefit analysis *(Sections 2 and 3).*
4. Promote full and appropriate utilization *(Section 4).*
5. Dispose of unneeded assets *(Section 5).*
6. Provide appropriate levels of investment *(Section 2).*
7. Accurately inventory and describe all assets *(Section 4).*
8. Employ balanced performance measures *(Appendix A).*
9. Advance customer satisfaction *(Section 3 and Appendix A).*
10. Provide for safe, secure, and healthy workplaces *(Section 2).*

This plan addresses the Council's template for agency asset management plans, which includes:

a. Integrated Guiding Principles *(Section 1).*
b. Agency-Specific Owner's Objectives *(Section 2).*
c. Periodic Evaluation of All Assets *(Section 4).*
d. Prioritized Operations and Maintenance & Capital Improvement Plans *(Sections 3 and 4).*
e. Identified Resource Requirements to Support Plans *(Sections 2, 3 and 4).*
f. "Building Block" Asset Business Plans in Agency Portfolio Context *(Section 4).*
g. Continuous Monitoring and Feedback Mechanism *(Section 3, 4 and Appendix A).*
h. Consideration of Socio-Economic-Environmental Responsibilities *(Section 5).*
i. Adequate Human Capital Support of Asset Management Organization *(Section 2).*
j. Common Government-wide Terminology *(to be added upon FRPC publication).*

The section numbers following each of the Council's principles and template items above provides a cross reference with NASA's Asset Management Plan.

With the Real Property Management Plan (RPMP) as the foundation, NASA's Asset Management Plan establishes a systematic, comprehensive approach to real property management. Real property is integral to achieving the *Vision for Space Exploration* "…to advance U.S. scientific, security, and economic interests through a robust space exploration program." Through excellence in real property management, NASA adds value to its programs and workforce by ensuring that its

[1] Real property is defined as land, buildings, structures, utilities systems, and improvements and appurtenances thereto, permanently annexed to land that is owned, leased or otherwise managed by NASA.

real property assets meet established goals. It also provides appropriate stewardship of these assets to achieve the best value for the American taxpayers' investment. The RPMP defines NASA's real property strategy along with associated goals and improvement initiatives for achieving excellence. The AMP addresses *how* NASA will implement the strategy and achieve these goals and initiatives.

The AMP also documents how NASA ensures economic use of its entire portfolio and who is accountable for excellence in real property management. It specifies and defines an integrated approach to real property management. Figure 1-1 shows the relationship among NASA's real property strategic and planning documents.

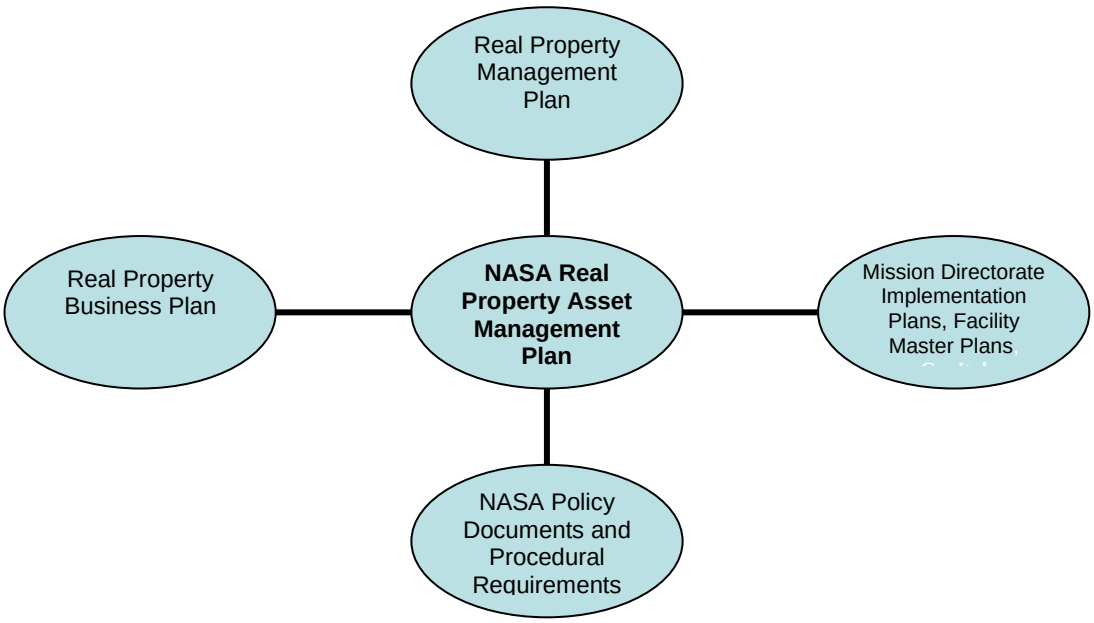


***Figure 1-1**: Integration of NASA Documents Comprising the Agency's Real Property Asset Management Plan*

Section 1 – *Introduction* provides an introduction and describes the approach and content of this plan.

Section 2 – *Support of Agency Missions and Strategic Goals* addresses NASA's mission and its real property support in implementing its missions and strategic goals, its human capital and organizational structure, decision-making framework, and owner's objectives.

Section 3 – *Planning and Acquisition of Real Property* describes how NASA plans for and acquires real property assets, develops its Capital Improvement Plan, identifies its prioritized acquisition list each fiscal year, measures the effectiveness of its acquisition results, and identifies key initiatives to improve financial management and acquisition performance.

Section 4 – *Operations of Real Property* describes how NASA operates its real property assets, addressing its inventory system, its Operations and Maintenance Plans, its Asset Business Plans or "Building Block" Plans and its periodic evaluation of assets. Additionally operational measures are described as l as key initiatives that are underway to improve operational performance.

Section 5 – *Disposal of Unneeded Real Property* describes how NASA disposes of unneeded real property assets, measures the effectiveness of its redeployment actions and identified key initiatives to improve the pace of disposition. NASA's recent disposals and future plans for disposals are provided in Appendix G.

Section 2. Support of Agency Missions and Strategic Goals

Investment, operational, and disposal decisions need to be integrated with and supportive of core mission activities to effectively manage and optimize real property assets. To facilitate integration of real property asset management decisions with the Agency's mission, two elements are needed – a clear understanding of the mission that drives the allocation and use of all available resources (human capital, physical capital, financial capital and technology/information capital) and an effective decision-making framework.

This section discusses NASA's mission, human capital, and decision-making framework and its application to real property management.

2.1 Agency Mission

Congress enacted the National Aeronautics and Space Act of 1958 to provide for research into problems of flight within and outside the Earth's atmosphere and to ensure that the United States conducts activities in space devoted to peaceful purposes for the benefit of humankind. Nearly 50 years later, NASA's new mission statement proudly pledges the Agency to continue the traditions begun in 1958: utilizing NASA's unique competencies in scientific and engineering systems to carry out and achieve the Agency's purpose:

To pioneer the future in space exploration, scientific discovery, and aeronautics research.

On January 14, 2004, President George W. Bush announced *A Renewed Spirit of Discovery: The President's Vision for U.S. Space Exploration*, a new directive for the Nation's space exploration program. The fundamental goal of this directive is "to advance U.S. scientific, security, and economic interests through a robust space exploration program." In issuing it, the President committed the Nation to a journey of exploring the solar system and beyond: returning to the Moon in the next decade, then venturing further into the solar system, ultimately sending humans to Mars and beyond. He challenged NASA to establish new and innovative programs to enhance understanding of the planets, to ask new questions, and to answer questions that are as old as humankind.

NASA enthusiastically embraced the President's directive as the Agency's Vision and published it as *The Vision for Space Exploration* in February 2004. That document embodies the strategy NASA will follow to extend a human presence throughout the solar system.

In September 2005, NASA adopted six Strategic Goals to focus the Agency toward achieving the Vision for Space exploration.

- **Strategic Goal 1**: Fly the Shuttle as safely as possible until its retirement, not later than 2010.
- **Strategic Goal 2**: Bring a new Crew Exploration Vehicle into service as soon as possible after Shuttle retirement.

- **Strategic Goal 3:** Develop a balanced overall program of science, exploration, and aeronautics consistent with the redirection of the human spaceflight program to focus on exploration.

- **Strategic Goal 4:** Complete the International Space Station in a manner consistent with our international partner commitments and the needs of human exploration.

- **Strategic Goal 5:** Encourage the pursuit of appropriate partnerships with the emerging commercial space sector.

- **Strategic Goal 6**: Establish a lunar return program having the maximum possible utility for later missions to Mars and other destinations.

To ensure that NASA's real property asset management is integrated with and enables its mission work, NASA developed a Real Property Management Plan, signed by the NASA Administrator in November, 2004, to describe the role of real property in achieving NASA's Mission in space exploration, scientific discovery, and aeronautics research.

2.1.1 NASA Real Property Management Plan

The NASA Real Property Management Plan (RPMP) (http://www.hq.nasa.gov/office/codej/codejx/RealPropertyManagementPlan02-04.pdf), which was developed as the basis for managing NASA real property, states:

> *"Real property is integral in achieving NASA's Vision and Mission in science, technology, and discovery. NASA provides value to its programs and workforce through excellence in real property management by ensuring real property assets meet Agency goals.*
>
> *NASA also provides appropriate stewardship of these assets to achieve the best value for the American taxpayers' investment. The Agency must strive to identify and develop innovative real property management solutions, and to construct and operate only the real property required to conduct NASA programs, maintain its core capabilities, and meet national responsibilities."*

The RPMP defines five major goals for ensuring real property supports NASA's mission and how real property must be considered throughout the Agency's decision-making process (Table 1-1).

- **Real Property Management Goal 1**: NASA will identify and address real property requirements as an integral part of Agency, Mission Directorate, program, and project planning**.**
- **Real Property Management Goal 2:** NASA will construct and operate new real property to meet mission requirements only when existing capabilities cannot be effectively used or modified.
- **Real Property Management Goal 3**: NASA will continually evaluate its real property assets to ensure alignment with the NASA Mission.
- **Real Property Management Goal 4:** NASA will leverage its real property to its maximum potential.
- **Real Property Management Goal 5:** NASA will sustain, revitalize, and modernize its real property required by the NASA Mission.

***Table 1-1**: Real Property Management Plan Goals*

NASA has significant real property challenges with an infrastructure approaching an average age of 40 years for its constructed assets, a rising backlog of repair needs, deteriorating facility conditions, and a potential significant amount of under-utilized or excess property. In striving to meet the above goals, NASA managers will do the following:

- Improve real property capital planning by integrating mission considerations into the real property decision-making process, making good business decisions when evaluating and selecting real property assets, evaluating and selecting real property assets by using an investment approach, and continually evaluating results.
- Determine the core facilities required to support NASA's mission.
- Identify, plan, and implement options to eliminate unnecessary real property through divestment, demolition, and other innovative programs.
- Ensure credible, long-term budget planning for constructed asset sustainment, revitalization, and modernization.
- Minimize the negative effects associated with competing stakeholder interests on real property decision-making.
- Ensure that historic properties are managed in a manner that promotes the long-term preservation and use of those properties as Federal assets and, where appropriate and consistent with NASA's mission, contributes to the local community and its economy.
- Provide employees with appropriate tools and incentives that facilitate good business decisions.

- Address human capital issues related to real property by recognizing that real property conditions affect NASA's ability to attract and retain high-performing individuals and the productivity and morale of employees.

2.1.2 NASA Strategic Plan

The NASA Strategic Plan provides the top-level strategy for how the Agency will accomplish its strategic objectives. Crosscutting management strategies form the underlying foundation for conducting the business of the Agency to support NASA's programmatic and institutional operations and to guide the Agency's strategic investment decisions and performance. They are braced by the Agency's core values, and reflect the Agency's commitment to successfully implementing the President's Management Agenda and Vision for Space Exploration. The strategies also serve as a guide for the development and maintenance of NASA's institutional programs, projects, and plans.

NASA's goals in its Strategic Plan address prudent asset management. Specifically, the Strategic Plan affirms,

> "Strategic management of NASA's real property assets is integral to achieving NASA's strategic goals. NASA's real property assets, including land, buildings, facilities, roads, and utility systems, constitute a major capital investment. NASA is the ninth largest federal government property holder. The Agency owns more than 100,000 acres of real estate and over 6,000 buildings and other structures totaling more than 44 million square feet. The current replacement value for NASA real property is over $20 billion.
>
> Real property also impacts employee morale and productivity. NASA provides value to its programs and workforce through excellence in real property management by ensuring that NASA's real property assets meet Agency goals. NASA also provides stewardship of these assets to achieve the best value for the American taxpayers' investment.
>
> The Agency will continue to identify and develop innovative management solutions and to purchase, construct, and operate only those assets required to conduct NASA programs, maintain the Agency's core capabilities, and meet national responsibilities."

2.1.3 NASA Strategic Management and Governance Handbook

The NASA Strategic Management and Governance Handbook sets forth the principles by which NASA strategically manages the Agency. It identifies the internal and external requirements that drive the Agency's key management principles. One of the cross-cutting management strategies

identified for governing, managing, implementing, monitoring, and controlling the work of the Agency is the "Strategic Management of Capital Assets." As a mission-driven Agency, a proper balance must exist between program requirements, maintaining unique specialized facilities/infrastructure and competitiveness.

2.2 Real Property Organization Mission

NASA recently transformed its organizational structure, streamlining the agency and putting it in a better position to implement the Vision for Space Exploration. This transformation restructured our Strategic Enterprises into Mission Directorates to better align with the Vision. It also restructured Headquarters support functions and clarified organizational roles and responsibilities. NASA functional offices were restructured as Mission Support Offices.

NASA Headquarters, located in Washington, D.C., exercises management over the space operations centers, aeronautics research centers, science centers and other installations that constitute NASA. Headquarters' principal roles and responsibilities are to:

1. Establish Agency policy.
2. Define strategy and architectures.
3. Ensure statutory/regulatory compliance.
4. Define program objectives and top-level requirements.
5. Monitor program performance.
6. Manage intergovernmental relationships.
7. Allocate resources.
8. Perform Headquarters essential services.

This model shifts the focus of Headquarters away from program implementation and toward strategic management; and it concentrates the Centers' efforts on program and project execution.

2.2.1 Facilities Engineering and Real Property Division Mission

The Facilities Engineering and Real Property Division (FERP) of NASA Headquarters, provides functional leadership for all Agency facility engineering programs including facility planning, construction, maintenance and real estate. In addition to leadership, FERP provides consulting, a wide range of enabling and analysis tools, and insight for NASA's real property to ensure that NASA has the facilities available that are necessary to meet NASA's mission.

In all aspects of NASA's real property and in partnership with the Mission Directorates and Centers, FERP creates opportunities to enable mission success.

- To ensure integration, best practices, and fiduciary responsibility for the Agency's construction program;
- To provide Agency functional leadership for facilities maintenance;

- To provide functional leadership for Agency real estate management and master planning; and
- To be the "honest broker" to senior management, and those with external oversight, regarding the NASA real property programs, taking an agency-wide view in support of "one-NASA."

To accomplish its mission, FERP strives for optimal real property performance by maintaining a global perspective; fostering continual breakthrough improvements; leveraging knowledge management, new technology, and buying power; searching for and promulgating industry best practices by participating with professional facility organizations; and providing appropriate advice and analyses regarding all real property matters for NASA.

2.2.1.1 Portfolio Management

NASA uses portfolio management to address its overall real property requirements from an Agency perspective. NASA's real property management is performed on a life cycle basis, including the following basic phases;

- **Planning**: NASA uses Master Planning at its Centers as well as advanced program planning at the Agency level. The Center Master Plan (CMP) is the Center's statement of its concept for the orderly management and future development of the Center's real property assets. It is the overall plan for Center development. It provides a narrative, statistical, and a graphic record of current capabilities and conditions (natural features, buildings, structures, utilities, transportation systems and other improvements), as well as proposed conceptual capabilities necessary to support program requirements, Mission Directorate requirements, and the NASA Strategic Plan. See NPD and NPR 8810 for more information on Center Master Plans (http://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PD_8810_0002_&page_name=main). Planning is an essential element of our real property program, and is required and measured prior to proceeding with real property actions. This phase also includes the relevant environmental documentation required before major real property actions can occur. Planning is the responsibility of the NASA Centers, with planning policy and overall plan approvals conducted at the Headquarters level. Planning is also conducted extensively through the NASA budget formulation process. Currently all NASA Centers do not have up-to-date Center Master Plans. The Facilities Engineering and Real Property Division is working closely with those Centers that do not have up-to-date CMPs to ensure that such Plans are being developed. NASA's goal is for all Centers to have up-to-date CMPs by December 2008.
- **Acquisition**: NASA acquires real property through many means, but the primary method is the use of new construction or renovations of existing assets. NASA also uses leasing as a vehicle for acquisition when necessary and where appropriate, depending on life cycle cost analyses. Acquisition is normally done through competitive construction, leasing or purchasing contracts. NASA constantly looks for innovative methods of acquisition, such as third party financing, when available and appropriate. It is also our policy to use existing assets wherever possible prior to acquiring new assets. Therefore, the NASA

acquisition program is relatively minor, with less than $100 million of new construction annually, and normally no new land acquisition.

- **Operations and Maintenance**: The life cycle of a constructed asset includes extensive operations and maintenance activities and costs. NASA has several initiatives in place to increase maintenance and operations efficiency and reduce the costs involved. NASA also encourages the replacement of old, inefficient and expensive assets with new, efficient and sustainable assets wherever possible.
- **Disposal**: NASA encourages demolition of constructed assets that are beyond their useful lives, and outleasing or otherwise leveraging the value of under-utilized or unneeded assets that are in good condition or may be required by NASA programs in the future. NASA seeks consolidations to reduce the amount of real property NASA must maintain in order to make more property available for re-use, revenue-generation, or disposal.

2.2.1.2 Facilities Engineering and Real Property Division Focus Areas

- **Planning and Real Estate**: Providing a wide-ranging perspective of current and planned physical resources; fostering alliances with other agencies and organizations to increase reliance on national facility capability and to eliminate unnecessary redundancies; exploring new opportunities such as enhanced-use leasing, public/private partnerships, and privatization; exploring new technologies for facilities management and master planning; maintaining NASA's real property inventory; and developing strategies and policies to implement and standardize asset management tools across the Agency.
- **Design and Construction**: Fostering, evaluating, and facilitating opportunities to improve constructed asset use, safety, health, security, maintainability, and sustainability; leading the planning, design, and construction of facility projects; stretching the buying power of related resources and assessing whether they are applied efficiently and effectively; developing and applying best practices for maximum return on investments at lower life-cycle costs.
- **Maintenance and Operations**: Ensuring required facilities reliability and availability at the minimum cost; developing standardized "tools" and improvement practices that incorporate advanced maintenance and operations methods and technologies; monitoring the condition and performance of the NASA plant; and advocating for appropriate NASA maintenance and operations funding.
- **Resources**: Providing leadership and support for resources and analyses for financial management, budget development, and funds expenditures in all facilities areas; interacting with external stakeholders including Congress and OMB; aligning NASA facilities budgets with full cost budgeting; and fully supporting and implementing Integrated Financial Management.

2.2.2 NASA Centers

The ten NASA Centers and associated facilities each have different missions, types of facilities and geographic characteristics. Mission support facilities include unique and world class aeronautics research facilities, space vehicle manufacturing, launch, and command and control

facilities. Locations range from the snow belt to the humid/corrosive environment of the Florida coast as shown by Figure 2-1. The Centers uses their Center Master Plans to guide real property decisions. See the NASA home page at www.nasa.gov for information on each Center.

Each Center has its own facilities management organization to support its real property requirements. These organizations report to their respective Center Director, who develops and manages his/her institution to meet the needs of the many and various programs assigned to that Center. The Center Director is responsible for sorting out resources and matching them to Agency priorities and is accountable for all Center real property management operations in support of program roles and missions. The Center Directors ensure that day-to-day real property management and operations are conducted in accordance with policies established by the Facilities Engineering and Real Property Division, Mission Directorates, Chief Financial Officer, and other Mission Support Offices at Headquarters. The facilities staffing at NASA Centers is unique at each Center due to the varied missions, history, geographic location and culture.

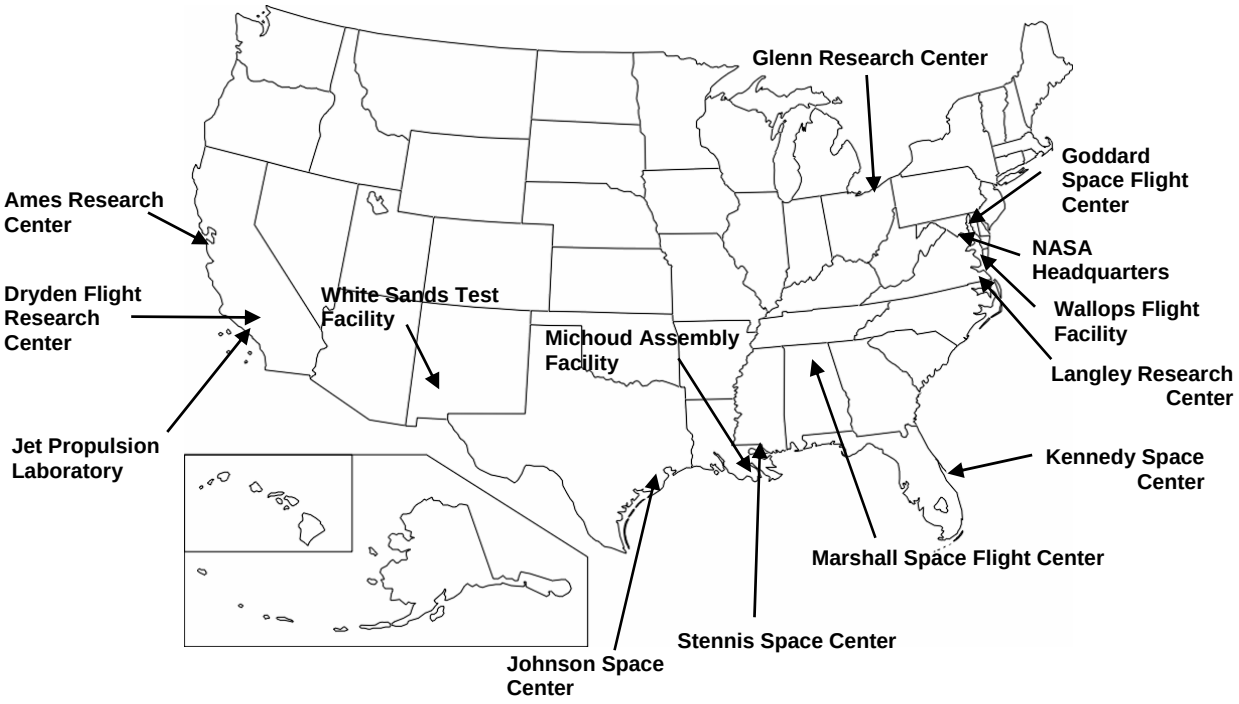


***Figure 2-1**: NASA Field Centers and Component Sites*
(Total NASA sites: approximately 63 in the continental United States and 26 Overseas including sites where NASA owns facilities but not the land.)

NASA Centers are embracing changes to traditional ways of doing business. For example, many of the Centers have implemented or are implementing hybrid performance based contracts for facility maintenance and operations. NASA is attempting to use the right method for each contract task while maintaining the performance based contract emphasis. As another example, Reliability centered maintenance (RCM) programs are in place and are being expanded with positive results (see Section 4.5). Partnering between NASA Construction Managers, Architectural-Engineering firms, and Construction Contractors is being used during design and construction contracts to

improve schedules, reduce change order costs, improve contractual relationships, and improve quality in the finished product. The primary tool used for this is the NASA Partnering Desk Reference available at http://www.hq.nasa.gov/office/codej/codejx/deskref.pdf. NASA Headquarters Facilities Engineering and Real Property Division is working on many innovative real property initiatives, and the Centers are actively pursuing similar initiatives. Sections 3, 4, and 5 describe them in greater detail.

2.3 Human Capital and Organization Infrastructure

2.3.1 Agency Reporting Structure

NASA's organizational structure is designed to promote efficient and effective management of all the activities required to operate its complex and diverse organization. The officials and staff at Headquarters have a broad Agencywide mission and "corporate" focus with a primary role to: (1) develop strategy and mission architectures; (2) integrate across program and mission boundaries; and (3) assess programs. The primary role of Centers is to manage programs and projects and execute the mission. The Agency strives to reach a reasonable balance of power between Headquarters and Centers. In accordance with this principle, the Center Directors report organizationally to the Associate Administrator (AA). Mission Directorates report to the AA and have no institutional oversight of Centers.

The NASA organization employs a "checks and balances" model aligning capability with responsibility which creates the appropriate level of management tension required for the successful execution of high-risk endeavors. In addition, a new Program Analysis and Evaluation (PA&E) organization was recently formed, whose purpose is to provide advice and recommendations to the Office of the Administrator on all aspects of NASA programs and issues of strategic importance to the Agency, the evaluation of alternative programs, and their cost effectiveness.

NASA is program/project driven, and its organization reflects that focus. Figure 2-2 is a notional representation of the NASA organization. All of the management elements, working in an integrated manner and honoring NASA's values (see Table 2-1), promote the leadership behaviors to help the Agency achieve its mission. If good strategic planning provides the long-term direction of our Agency, our shared core values express the ethics that guide our behavior.

NASA Values	
Safety	*NASA's constant attention to safety is the cornerstone upon which we build mission success. We are committed, individually and as a team, to protecting the safety and health of the public, our team members, and those assets that the Nation entrusts to us.*
Teamwork	*NASA's most powerful tool for achieving mission success is a multi-disciplinary team of competent people. The Agency will build high-performing teams that are committed to continuous learning, trust, and openness to innovation and new ideas.*
Integrity	*NASA is committed to an environment of trust, built upon honesty, ethical behavior, respect, and candor. Building trust through ethical conduct as individuals and as an organization is a necessary component of mission success.*
Mission Success	*NASA's reason for being is to conduct successful space missions on behalf of this Nation. We undertake missions to explore, discover, and learn. And we believe that mission success is the natural consequence of an uncompromising commitment to safety, teamwork, and integrity.*

***Table 2-1**: NASA Values*

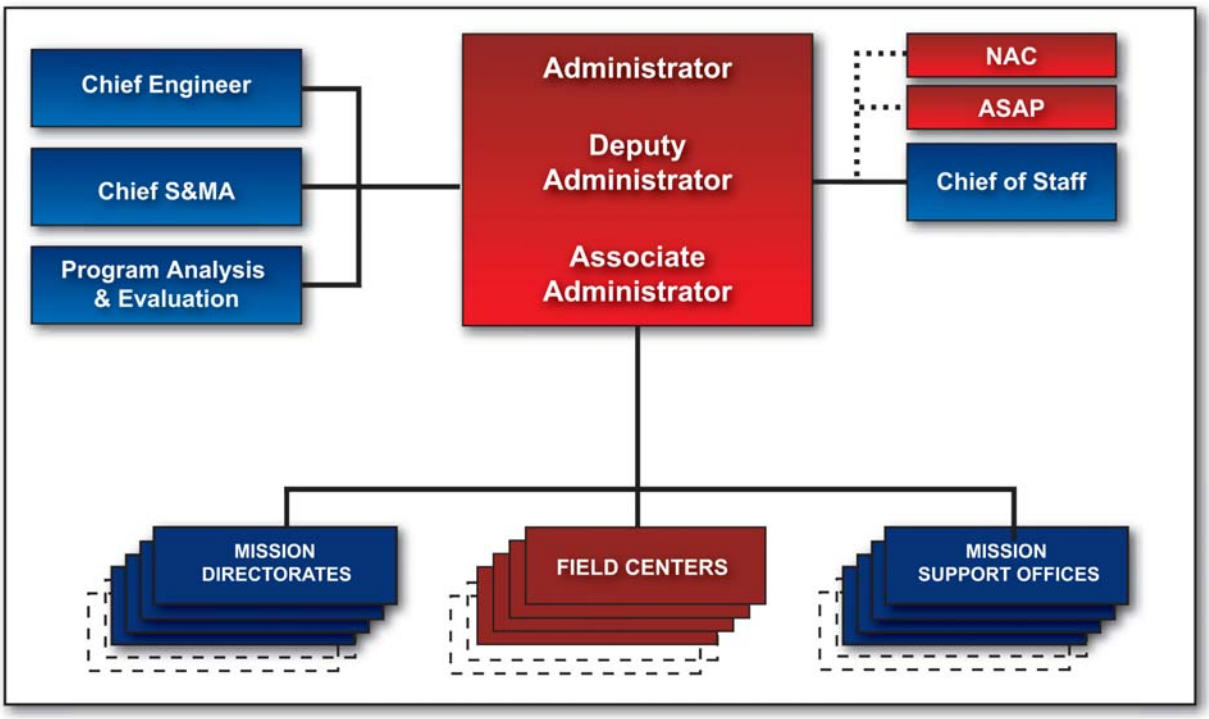


***Figure 2-2**: NASA's Organizational Structure*

2.3.2 Real Property Asset Management Reporting Structure

Achieving results is the shared responsibility of all organizations at all levels. The Centers directly manage the large majority of NASA's real property with guidance and oversight from Headquarters. The Centers' real property management organizations report to their respective Center Directors, who in turn report to the Office of the Administrator.

The Associate Administrator for Institutions and Management (AA/IM) at Headquarters serves as the principal integrator and advisor to the Administrator and Deputy Administrator on policy and management of real property assets and institutional operations. The Office of Infrastructure and Administration, Facilities Engineering and Real Property Division, and the Agency real property community serve as the strategic advisors to Agency and Center management on real property issues. Line managers are responsible for making effective use of real property data, programs, practices, and tools and for identifying impediments to and opportunities for improving the institutional management of real property. The RPMP's section, "Accountability and Responsibilities for Achieving Results," provides greater detail on NASA's reporting structure and the levels of authority for making real property decisions: (http://www.hq.nasa.gov/office/codej/codejx/RealPropertyManagementPlan02-04.pdf). Figure 2-3 shows an overview of the integration of the three-tiered approach with NASA's existing organizational structure.

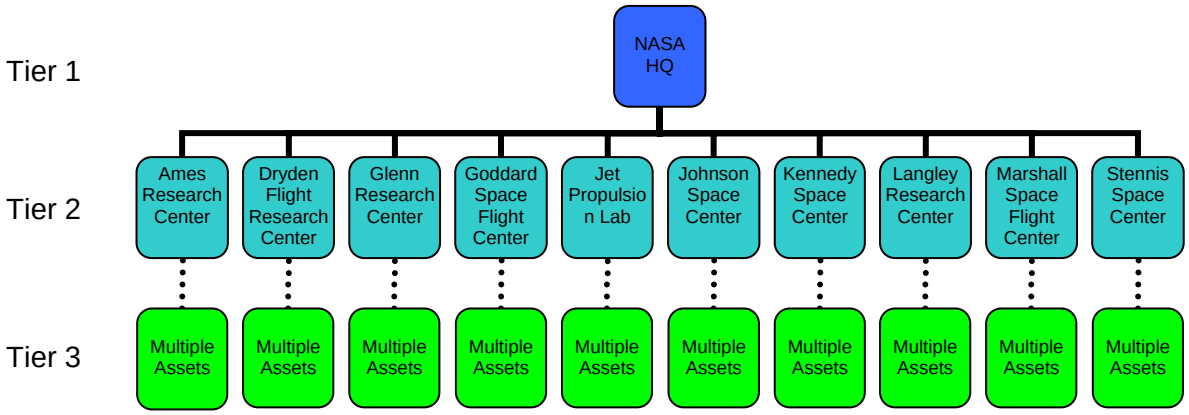


***Figure 2-3**: Agency Asset Management Integration*

2.3.3 Human Capital

NASA's core competencies are recognized as integral, necessary, and critical contributors to achieving Agency strategic objectives. NASA understands the importance of having a competent real property workforce with the appropriate skills and training to support the Agency's core competencies, goals, and mission. Strategic management of human capital is critical for strengthening the Agency. Hence, NASA developed the Strategic Human Capital Plan (http://nasapeople.nasa.gov/hcm/Agency_SHCP-Final1.pdf) and the Strategic Human Capital Implementation Plan (http://nasapeople.nasa.gov/hcm/Agency_SHCIP-Final2.pdf) to guide its human capital management decisions. In response to the President's Management Agenda and the NASA Strategic Human Capital Plan, NASA created a Competency Management System (CMS)

as a tool to help managers identify and maintain their core competencies (http://nasapeople.nasa.gov/workforce/data/page18.htm).

The CMS is an Agency wide collection of business processes, data and tools, shared by all Centers, to measure and communicate the Agency's corporate knowledge base. It is used to assess alignment with the overall Agency mission by measuring imbalances in current or future workforce compared to NASA strategies and program and project requirements. Using quantitative data, it is also used to support decisions about how to invest wisely in areas such as training and development, recruiting, and career planning. Program managers use the competency information to augment other workforce information to align the workforce to the Agency's mission.

NASA's Real Property core competencies include Master Planning, Facilities Engineering and Management, Facility Civil Engineering, Facility Mechanical Engineering, Facility Electrical Engineering, Construction Management, Real Property Management, Facilities Operations and Maintenance. These competenices have been documented in the Agency's CMS. NASA supports continuous learning to strengthen these Real Property core competencies and to remain cognizant of and import applicable industry trends, benchmarks, and best practices. The Facilities Engineering and Real Property Division conducts periodic reviews of facilities staffing, using contractors experienced with such analyses. These reviews include benchmarking with similar organizations to adequately determine staffing needs.

2.4 Real Property Asset Management Decision-Making

2.4.1 Role of Strategic Planning in Asset Management Decision-Making

Decision-making begins with strategic planning. Strategic planning is the process of identifying strategic goals and objectives and then developing and implementing plans to reach them. The Agency's priorities are set by the vision established by the President. The vision forms the basis for NASA's Mission. The Agency Mission is achieved through strategic goals/objectives, which are pursued tactically through specific performance goals. Performance goals, which are synonymous with requirements, are met through programs and projects.

NASA controls all strategic management processes through its governance structure, which consists of three Agency-level management councils:

- The **Strategic Management Council** determines NASA strategic direction at the vision and mission level, and it assesses the Agency's progress on this level as well.
- The **Program Management Council** guides program and project performance, defining successful achievement of NASA strategic goals and objectives.
- The **Operations Management Council** reviews and approves institutional plans.

Asset management decisions are vetted through the Operations Management Council. This Council serves as NASA's senior decision-making body for reviewing and approving capital investments and issuing institutional budget guidance. A comprehensive view of NASA's strategic management process is shown in Figure 2-4.

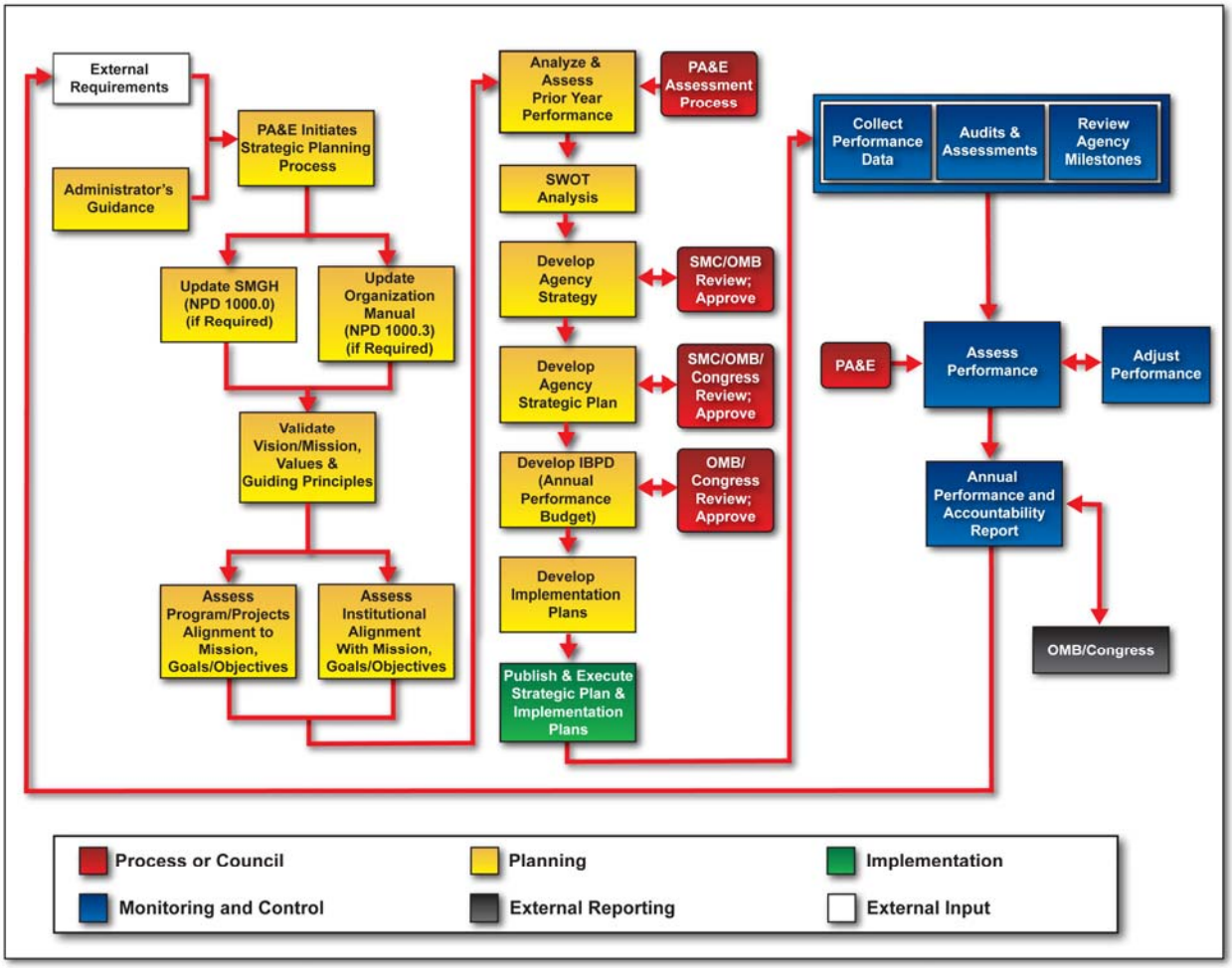


***Figure 2-4**: NASA's top-level strategic planning process*

As part of the strategic planning framework, NASA is required to submit to OMB an Annual Performance Budget. The Agency uses a rigorous planning and budgeting process, including full-cost accounting, to ensure that resources are properly allocated at all levels to meet mission and institutional needs. This process ensures accountability for stewardship of resources throughout the Agency, allows Agency leadership to ensure that financial decisions match Agency priorities and to make appropriate tradeoff decisions, and to respond to external requirements for budget submission and execution materials.

In order to ensure asset decision-making is addressed early during program and project formulation, NASA's key policies for programs and projects require early analysis of real property needs. NASA Procedural Requirement, Program and Project Management Processes and Requirements (NPR 7120), http://nodis3.gsfc.nasa.gov/7120, governs the formulation, approval, implementation, and evaluation of all Agency programs and projects. For each new project, one of the first steps during the project formulation phase is for Center project managers to conduct a

comprehensive analysis of infrastructure needs. In alignment with the Real Property Management Plan, the policy requires the project manager to coordinate with the Facilities Engineering and Real Property Division and/or the Center facilities organization to assess existing Agency wide capabilities to meet infrastructure needs. It also requires the project manager to assess whether facilities in other Government agencies, industry, academia, and international organizations can be utilized to reduce project life cycle cost and risk. Through synergy with other programs and projects, NASA can avoid costly duplication of supporting infrastructure. See Section 2.4.2 for more detail on this process.

The strategic management framework, shown in Figure 2-5, drives mutual alignment of the NASA Strategic Plan with all subordinate plans, including Mission Directorate Implementation Plans, the Agency Institutional Implementation Plan, performance plans, program and project plans, and implementing workforce and facilities plans at the Centers. The Agency Institutional Implementation Plan is currently being developed and will have clear requirements traceability back to the Strategic Plan in order to verify compliance to the plan, to define the baseline from which monitoring and evaluation will occur, and to enable the development of performance reporting to external stakeholders.

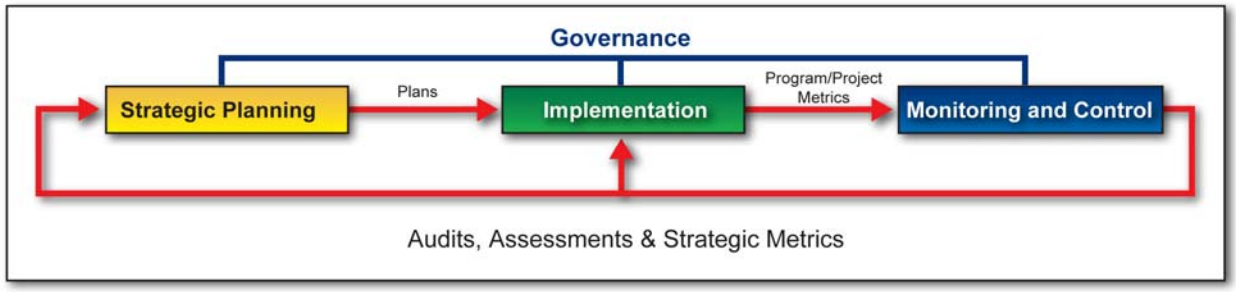


***Figure 2-5**: Strategic Management Stages*

NASA uses the Real Property Management Plan (RPMP) as the strategic planning document for identifying Agency real property goals. The RPMP will ultimately be incorporated into the Agency's Institutional Implementation Plan. The RPMP goals and associated improvement initiatives, as shown in Table 2-2, serve as drivers for NASA management's use in making real property asset management decisions.

Goal 1 – NASA will identify and address real property requirements as an integral part of Agency, Mission Directorate, program and project planning.
A. Include real property requirements and associated life-cycle costs in program/project budgets from the early planning stages.
B. Ensure facility program/project managers participate as members of the mission/program team from the inception of the program.
C. Ensure Mission Directorates and program managers continually review real property requirements throughout the program life cycle and address changing requirements.
D. Identify capability shortages and determine how they will be addressed.
E. Ensure Agency- and/or Mission Directorate-validated strategic (future) capabilities are maintained.
Goal 2 – NASA will construct and operate new real property to meet mission requirements only when existing capabilities cannot be effectively used or modified.
Seek alternatives to new construction by using the following approach:
A. Consider advanced technologies as alternatives to brick-and-mortar facility solutions.
B. Use/modify existing NASA real property.
C. Leverage the resources (fiscal and physical) of other Federal agencies, industry, and academia.
When construction is needed, NASA will do the following:
A. Plan, design, and construct facilities for sustainability to ensure new facilities are of the right size and type; are safe, secure, and environmentally sound; provide quality workplaces; and operate efficiently and effectively.
B. Advocate for appropriate construction, operation, and deconstruction funds.
C. Use advanced technologies for NASA master planning, design, construction, and facility operations.
Goal 3 – NASA will continually evaluate its real property assets to ensure alignment with the NASA Mission.
A. Identify and address real property requirements as an integral part of Agency strategic planning.
B. Conduct and periodically update a corporate analysis that correlates Mission requirements with real property infrastructure.
C. Identify real property capability gaps and determine how to fulfill the capability.
D. Identify and eliminate redundant and excess real property capabilities.
E. Demolish/deconstruct unneeded facilities.
F. Develop and maintain Center Master Plans (update every 3 years) that ensure the future physical development of each Center effectively and efficiently supports the NASA Mission. Note: these plans are living documents and are updated as necessary based on changes to mission or other mission related actions. There is a formal requirement to perform a 3-year review to ensure that the CMP is up to date.
Goal 4 – NASA will leverage its real property to its maximum potential.
A. Seek alternatives to NASA ownership of real property where feasible and economically viable.
B. Seek alternative uses for its underutilized real property, including outleasing and consolidation of functions.
C. Make full use of authorities that allow public/private agreements and cost sharing, such as enhanced-use leasing authority and Space Act agreements.
D. Seek third-party financing/services-in-kind opportunities, including privatization, for facility management (e.g., transfer NASA utilities to commercial entity and purchase services).
E. Market temporarily available capacity to non-NASA customers.
F. Divest real property when appropriate.
G. Seek adaptive re-use of historical facilities wherever possible.
Goal 5 – NASA will sustain, revitalize, and modernize its real property required by the NASA Mission.
A. Define target levels for NASA facilities conditions.
B. Determine and allocate the resources to achieve the target levels.
C. Use advanced technologies and best practices for NASA sustainment, revitalization, and modernization.
D. Implement sustainment best practices for all facility requirements, including maintaining historical facilities, environmental stewardship, and safety and health considerations.

***Table 2-2**: Real Property Management Plan Goals and Initiatives*

2.4.2 Asset Decision Process

NASA's real property asset management decisions are generally the responsibility of line organizations. Line managers have authority over their budgets, schedules, and human and real property assets. They are responsible for working across organizational lines to perform appropriate integration functions and make day-day decisions using portfolio management in line with guidance and oversight from Headquarters. Governance by the Strategic Management Council, the Operations Management Council, and the Program Management Council are used in the cases where decisions require high degrees of integration, visibility, and approval.

2.4.2.1 New Requirement

As shown in Figure 2-6, a new capability requirement is normally first identified by a NASA Program or Project, a NASA Center, or a Mission Directorate. New capability requirements are those that at least initially appear to require new construction in order to meet the needs of the owner, such as a Program or Center. New construction may include conversion of an existing constructed asset to a different function, additions to existing assets, or the construction of a totally new building or asset.

The first step in this process is to validate the requirement for new construction as briefly described in Section 2.4.1 above, NASA procedural requirements (NPR 7120) require a Program Manager to prepare a business case for new construction. The business case includes full life cycle cost (including operations, sustainment, and disposal), benefit estimates, alternatives and sensitivity analyses, and risk assessments. For example, an alternatives analysis to the use of a constructed asset might include the use of computer modeling to meet the requirement. The business case is reviewed and concurred by FERP and the appropriate Mission Directorate. The Facilities Engineering and Real Property Division, supported by the Office of Program Analysis and Assessment, validates new requirements proposed by the Centers and others.

The next step is to prepare the acquisition strategy. New construction is the last option for meeting new capability requirements. Alternatives, including use of existing assets, or use of non-NASA assets, are also reviewed and the most cost effective method of meeting the requirement is chosen and implemented. Acquisition of constructed assets through lease or construction is discussed in other sections of this plan and is covered in detail in the NPR's shown in Figure 2-6.

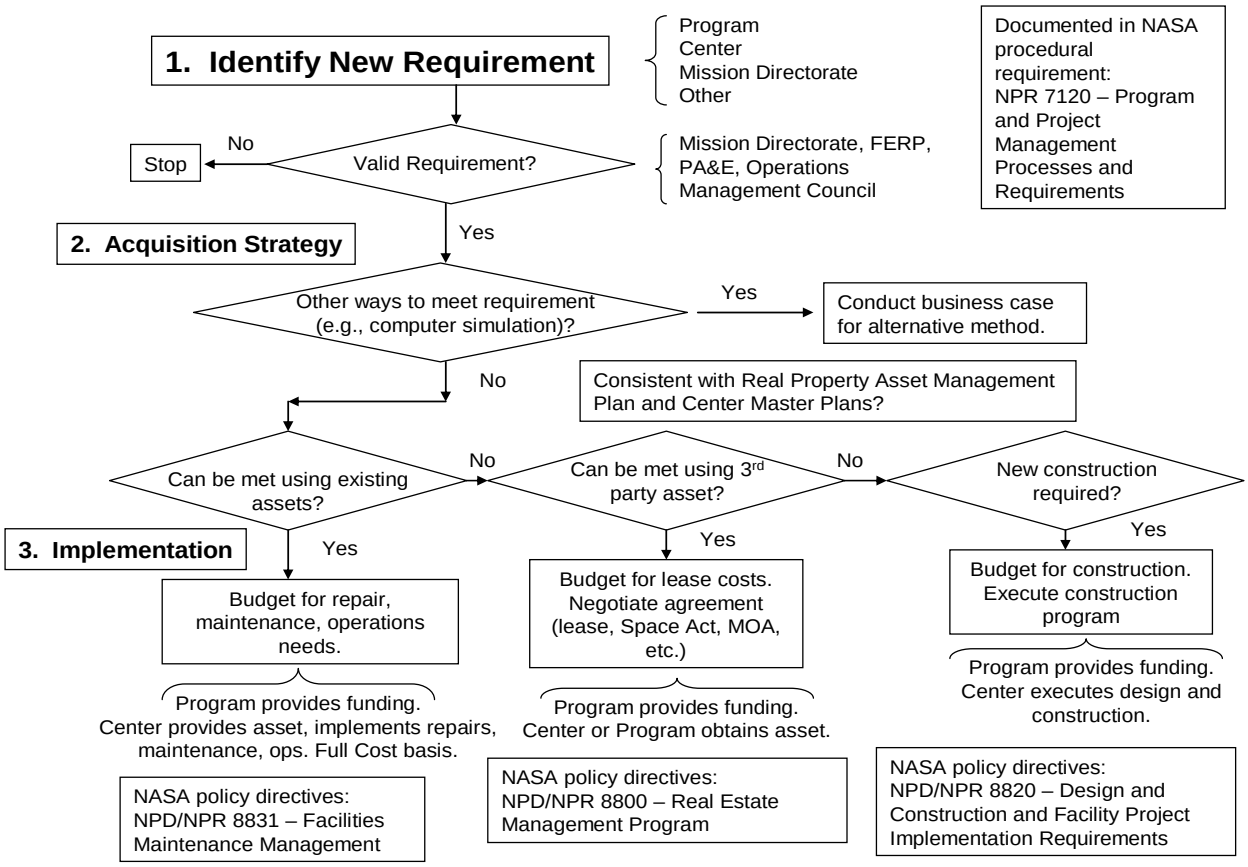


***Figure 2-6**: Real Property Decision Process, New Requirements*

2.4.2.2 Existing Assets

The process for managing NASA existing assets is different than that for new requirements. Existing assets are reviewed on an annual basis by the Centers, Mission Directorates, and FERP during the budget preparation process, or as-required based on an assets business base. NASA will use a disposition decision process to manage its existing assets, as shown in Figure 2-7. The factors used to determine the disposition of assets include mission dependency, utilization, condition, and efficiency (operations and maintenance costs). Figure 2-7 shows a simple process for the determination of the disposition of existing assets, however, no one factor will be the sole determination of asset disposition. Rather, these factors are used to focus attention on those assets that may need additional attention. For example, assets that are found to be no longer needed for mission (mission dependency), may be analyzed for disposal through demolition, sale, or out leasing. Utilization may drive consolidation decisions, disposal decisions, or acquisition decisions. Condition and efficiency may indicate the need for additional maintenance, repair, and upgrade resources.

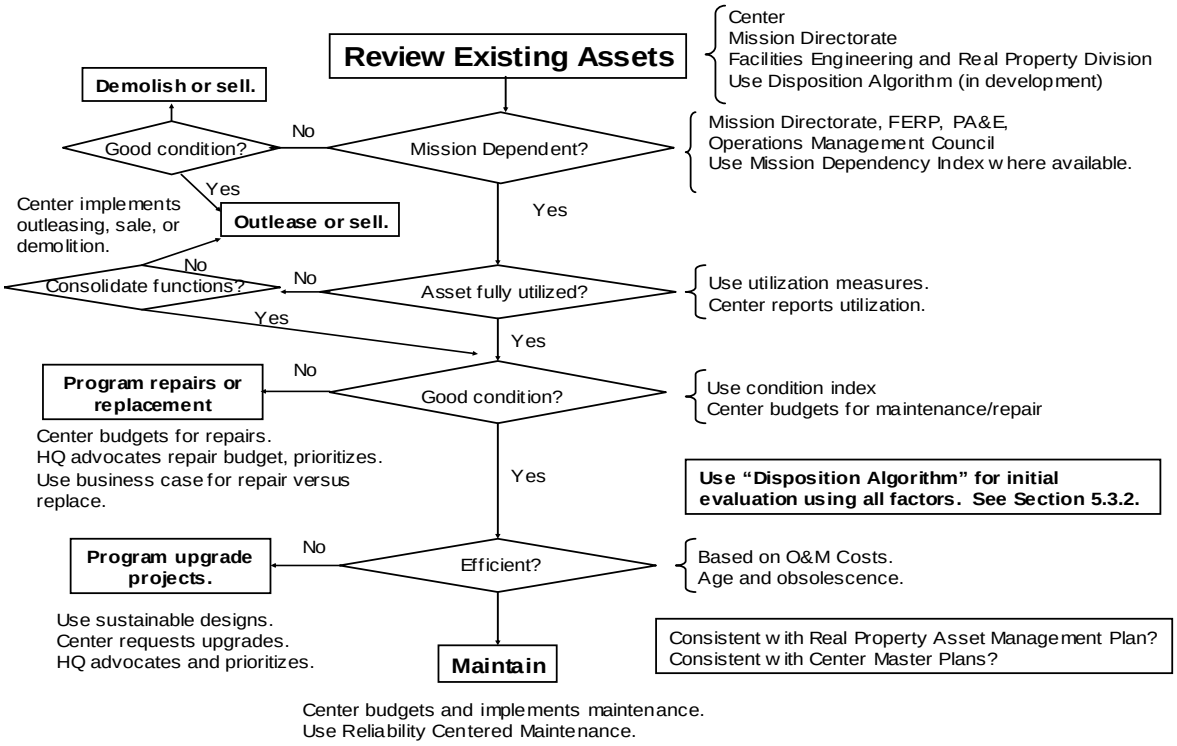


***Figure 2-7**: Real Property Decision Process, Exiting Assets*

2.4.2.3 Shared Capability Assets Program

NASA is responsible for managing many high-cost capital assets and capabilities that support the Nation's research and development needs as well as the needs of this Agency, now and in the future. Examples of such assets include wind tunnels, rocket propulsion testing facilities, thermal vacuum facilities, and high-performance computing capabilities. Many of the capabilities are unique and expensive to operate, in large part because the long-term demand for their use is difficult to anticipate. NASA Centers responsible for hosting these capabilities often do not have a sufficient number of customers for these services to pay for the total cost of their operation. Consequently, host Centers and a few paying customers have to subsidize inordinately the full cost of associated assets.

NASA must ensure that Agency- and/or Mission-Directorate-validated strategic capabilities are maintained (Ref. NASA Real Property Management Plan, Goal 1). NASA must also preserve its shared capability assets (skills, equipment, sites, and facilities) into the future. A proper balance must be maintained between program requirements, facilities/infrastructure and staying competitive. In order to prevent any one Center from having to bear the full costs of a critical NASA and/or national asset, NASA has established a Shared Capability Assets Program and separate Headquarters programming and budgeting process.

The Shared Capability Assets Program and associated corporate capital account allow Centers to conduct economically viable business while maintaining the Agency's core capability assets. The establishment of the corporate capital account for unique or highly specialized facilities and infrastructures also increases utilization and efficiencies across a particular asset class and promotes institutional excellence. This supports competitive pricing of NASA capital and unique assets. NASA will use the Program to identify and prioritize its critical assets and make strategic investment decisions to replace, modify, or disposition them based on NASA and/or national needs.

As discussed previously, existing assets are reviewed on an annual basis by the Centers, Mission Directorates, and the Office of Infrastructure and Administration during the budget preparation process, or as required based on an assets business base (see Figure 2-7). An asset becomes a candidate for inclusion into the Agency's Shared Capability Assets Program when the asset -

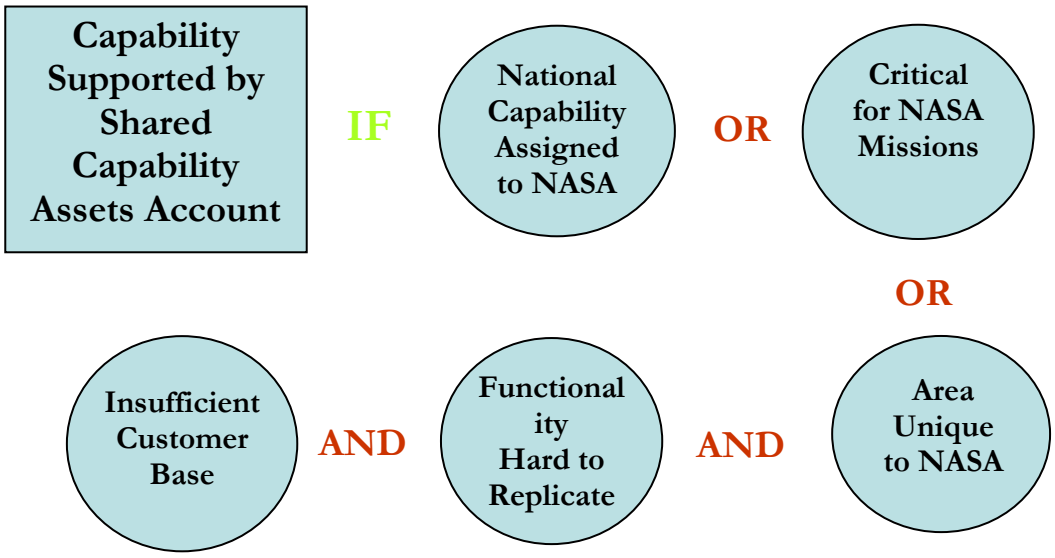
1. is determined to be a national capability assigned to NASA; or,
2. is determined to be critical for NASA missions; or,
3. supports an area unique to NASA;

And,

The asset's functionality is hard to replicate;

And,

The asset has an insufficient customer base.



Key Assumption: All like assets will be grouped together and considered as a single capability

***Figure 2-8**: Shared Capability Assets Program Criteria*

Specifically, NASA evaluates the asset considering the following factors:

- Asset is critical to carry out NASA Mission, now or in the future.
- Asset is a Shared Capability.
- There exist no feasible alternatives.
- Asset is world-class.
- Asset supports area in which NASA is uniquely qualified to perform and where investments can be highly leveraged to add value to overall business or mission.
- Functionality of the asset is hard to replicate without significant investment.
- Asset has a high replacement cost vs. annual O&M cost.
- Asset is central to "competitiveness."
- Asset can be priced based on usage; demand can be forecast to enable asset estimate.
- Current customer base is not sufficient to economically sustain asset.

NASA uses the above factors along with other analysis and programmatic considerations, to make final determinations about whether an asset is included in the Shared Capability Assets Program. If an asset is determined to be in the Program, then *all* like assets will be grouped together and considered as a single capability, or asset class within the Program. After nomination, review, and selection by the Agency, assets and/or asset classes will be added to or withdrawn from the Shared Capability Assets Program account based on an overall prioritization and balance among the assets being considered, and within the overall constraints of Agency priorities and resources.

The Office of Infrastructure and Administration staffs and manages the Program, establishes budget requirements in coordination with the Office of the Chief Financial Officer, and interfaces with the Mission Directorates, Mission Support Offices, Centers, and the Office of Program Analysis and Evaluation. The Operations Management Council and Strategic Management Council are the governing authorities for the Shared Capability Assets Program. See Section 5.1 for more details on the Shared Capability Assets Program.

2.5 Owner's Objectives

NASA has established a set of qualitative owner's objectives specific to its portfolio, which are detailed in NASA's Real Property Management Plan. Table 2-2 above outlines the RPMP goals and associated improvement initiatives. Quantitative owner's objectives are expressed in NASA's long-term outcome goals and performance targets listed in Appendix A.

These Real Property Management Strategic Goals are the foundation for developing a portfolio or asset level strategy. NASA's asset management framework involves understanding and balancing mission needs/risks and the condition/performance of its assets. The strategic underpinning of this framework is to exploit new technologies to move physical infrastructure beyond brick-and-mortar facilities solutions and leverage national, industrial and intellectual capabilities. NASA is also committed to providing stewardship of these assets in the best interest of the American taxpayer's investment.

2.6 Benchmarking

NASA employs tools that ensure sound real property asset management decisions, for example benchmarking and best practices. Benchmarking identifies, measures, and compares processes, products, and services with those of recognized leaders to achieve superior performance. NASA performs benchmarking internally among NASA Centers and externally with other agencies and private industry. From these benchmarking activities, best practices are developed from those practices that are deemed to enhance NASA's rates of success in real property asset management. NASA is a member of and actively participates in a number of leading organizations where benchmark information is shared. They include: the Real Estate Executive Board, Construction Industry Institute, FIATECH, Federal Facilities Council, Society for Machinery Failure Prevention Technology, Society of American Military Engineers, National Institute of Building Sciences, Building Commissioning Association, Association for Facilities Engineering, Association of Physical Plant Administrators, US Green Building Council, National Science and Technology Council and the Society for Maintenance and Reliability Professionals. NASA has also conducted specific benchmarking studies recently in such areas of construction safety and reliability centered maintenance. Refer to Appendix B, where a partial list of NASA benchmarking reports and best practices are provided.

Section 3. Planning and Acquisition of Real Property

NASA's acquisitions are driven by mission requirements. During the planning and acquisition phases, NASA translates mission needs into requirements, marshals the necessary resources and ensures that the necessary real property assets are delivered. Planning and acquisition are similar to other projects in terms of the level of analysis and management practices needed for successful execution.

As with other projects per NPR 7120, NASA Program and Project Management Processes and Requirements, the cognizant Mission Support Office invests in a period of concept screening (e.g., business case analyses) prior to committing to a real property project. This up-front effort is considered part of the project pre-formulation period. In accordance with NPR 8800.15, NASA Real Estate Management Program Implementation Manual, all requests for approval to take Real Property acquisition actions are forwarded to the Director, Facilities Engineering and Real Property Division by the Center. The request for approval is coordinated with the Mission Directorates and other NASA Senior Management officials as appropriate. The request is to include information on the real property action such as the description of the asset to be acquired, justification to acquire the asset, and availability of other sites, both Government and non-Government owned. These requests assure among other aspects that NASA looks to use existing Government-owned assets first before seeking to add assets or square footage to the federal inventory.

If there are no suitable solutions, NASA has three main alternatives - building a new Federal asset, buying an existing asset, or leasing a new asset from the private sector. To determine the acquisition method, NASA considers: how many assets are needed, how quickly the asset is needed, how long the asset is needed, and how specialized the asset is, or how complex the requirement is to determine the acquisition approach that is most appropriate. Each of these factors has a significant impact on the cost of alternatives and thus the feasibility of the project acquired either by construction, purchase, or lease.

NASA has authority under the National Aeronautics and Space Act of 1958, as amended (http://www.hq.nasa.gov/ogc/spaceact.html) to acquire real estate interest whether through gift, purchase, lease or other means. The Space Act states in part in Section 203.c.3; "In the performance of its functions the Administration is authorized--(3) to acquire (by purchase, lease, condemnation, or otherwise), construct, improve, repair, operate, and maintain laboratories, research and testing sites and facilities, aeronautical and space vehicles, quarters and related accommodations for employees and dependents of employees of the Administration, and such other real and personal property (including patents), or any interest therein, as the Administration deems necessary within and outside the continental United States; to acquire by lease or otherwise, through the Administrator of General Services, buildings or parts of buildings in the District of Columbia for the use of the Administration for a period not to exceed ten years without regard to the Act of March 3, 1877 (40 U.S.C. 34); to lease to others such real and personal property; to sell and otherwise dispose of real and personal property (including patents and rights thereunder) in accordance with the provisions of the Federal Property and Administrative Services Act of 1949, as amended (40 U.S.C. 471 et seq.); and to provide by contract or otherwise for cafeterias and

other necessary facilities for the welfare of employees of the Administration at its installations and purchase and maintain equipment therefore."

3.1 Capital Improvement Plans

NASA's Facilities Engineering and Real Property Division plays a key role in securing the necessary resources to maintain current real property assets, acquire new or replacement assets that meet the evolving needs of the agency, and preserving the historical and cultural assets placed in NASA's trust. The annual real property Capital Improvement Plan is part of the Agency's 5-year budget described in NPD 1000, NASA Strategic Management and Governance Handbook. The annual capital improvement plan contains those CoF projects that were prioritized and approved for funding using the process described in Section 3.1.1. NASA's prioritized Capital Improvement Plan for FY2005 can be found in Appendix C. The Capital Improvement Plans for FY2006 and FY2007 are located in Appendices D and E, respectively.

NASA Headquarters is in the process of preparing a 6-year Capital Improvement Plan for the Agency, which coordinates each Center's proposed projects among other Center's projects in the Agency. The NASA Capital Improvement Plan will contain those projects above $5M that, based on the Center Master Plan and other policies, are recommended for implementation in the succeeding six years. Capital improvement projects are those that directly relate to a Center's Master Plan, including major repairs, repair-by-replacement, new construction, and demolition.

3.1.1 Construction and Repair Project Prioritization Process

Beginning with the FY 2005 budget preparation process, NASA institutional construction and repair (CoF) projects are prioritized using an algorithm that "scores" projects based on many factors, including mission criticality, current corporate initiatives, such as security, deferred maintenance, health and safety initiatives, American with Disabilities Act requirements, repair-by-replacement, sustainability, Facility Condition Index (FCI), and others. The algorithm is developed each year by a Headquarters team of mission and mission support offices (with Center input), with the scoring factors and the weighting of the factors based on current Agency initiatives and priorities. The resulting prioritized list is presented to the Centers and Headquarters offices for reclama, and the final list is presented to the Facilities Review Board, and approved by the Operations Management Council and Strategic Management Council as applicable.

Additionally, by also asking for an "unconstrained prioritized list" of projects from the Centers in order to prepare the prioritized list, NASA is also able to develop a true picture of institutional CoF requirements. This is then used in conjunction with our performance measures to justify total funding levels for major facility projects.

Program Direct CoF projects, which are funded directly by the Programs, are not involved in the prioritization process. These are generally projects required to support new programmatic needs. They do, however, go through the approval decision process discussed in Figure 2-5 and the business case process described in Section 2.4.

3.1.2 CoF Project Approval Levels/Budgeting Process

Included within the current 5-year NASA budget is the Construction of Facilities (CoF) Program for projects and real estate acquisitions to accomplish NASA missions. Components of NASA's Capital Improvement Plan include Discrete Projects ($5 million and over), Minor Projects ($500 thousand up to $5 million), Facilities Planning and Design, and Demolition Projects.

NASA requires Congressional approval or direct appropriations for Discrete Projects, which are line items in NASA's budget. Minor Projects are grouped as a lump sum by Field Center. The process for developing the Capital Improvement Plan for submission to Congress is part of the NASA budget formulation process.

The CoF program is developed through a process involving Centers, Headquarters, and OMB, as part of the annual budget preparation process, also known as the Program Operating Plan, or "POP" process. Figure 3-1 shows a typical time line for the POP process. The time line depicts the major activities of the budget process, when they occur, and the level in the Agency at which they are performed. These activities are identified as either Institutional or Program Budget events. Institutional requirements are developed and submitted by the Centers in the early phase of the process. The Agency decides on the appropriate size of the institutional budget to establish the labor, service pool, and Center G&A rates for use in Program Budget development. Next the Centers' develop and submit their Program Budget for Agency review. Once program decisions are finalized any adjustment required to the institutional rates are made and the budget is submitted to OMB.

Project funding thresholds are based on the annual authorization and appropriation legislation; and the National Aeronautics and Space Act of 1958, as amended. The authorities and responsibilities identified in NPD 7330.1, Approval Authorities for Facility Projects, apply to all CoF projects and are responsible for ensuring conformance with applicable legislated limitations. Current thresholds and authorities are as follows:

- Routine Facility Maintenance: Center authority, unlimited annual amount. Annual amount spent and plans for future annual maintenance spending are reported to Headquarters.
- Center Authority Repair: Projects under $500,000 are planned, programmed, budgeted, approved and implemented by the Center. Repair projects $50,000 to $500,000 are reported to Headquarters.
- "Minor" Repair and Construction: Projects $500,000 to under $5 million are developed and implemented by the Centers but require Headquarters approval (Mission Directorate and Facilities Engineering and Real Property Division). The "Minor" project budget is reported as a NASA-wide lump sum in the President's budget. In FY 2004 and FY 2005, these funds were included in the Center General overhead and Administrative budgets. Beginning in FY2006, NASA plans to place these funds back into an Agency-wide account.
- "Discrete" Repair and Construction: Projects over $5 million are developed and implemented by the Centers but require Headquarters approval (Mission Directorate and FERP). Discrete projects are listed individually in the President's budget and changes to

them must be approved in advance. Discrete funds are managed by FERP until contract award. The contracts and projects are managed by the Centers.

The Construction of Facilities (CoF) program development and approval process is depicted in Figure 3-2, CoF Program Management. The figure shows the detail of how the CoF program process flows from one organization to the next. The activities accomplished by each organization during that part of the process are identified under the boxes. The "Program Development" and "Program Approval" sections show the detailed activities for the CoF Program associated with the POP process depicted in Figure 3-1. The "Program Execution" section shows how resources and project approvals are provided to the Centers and the program/project management roles and responsibilities of each organization.

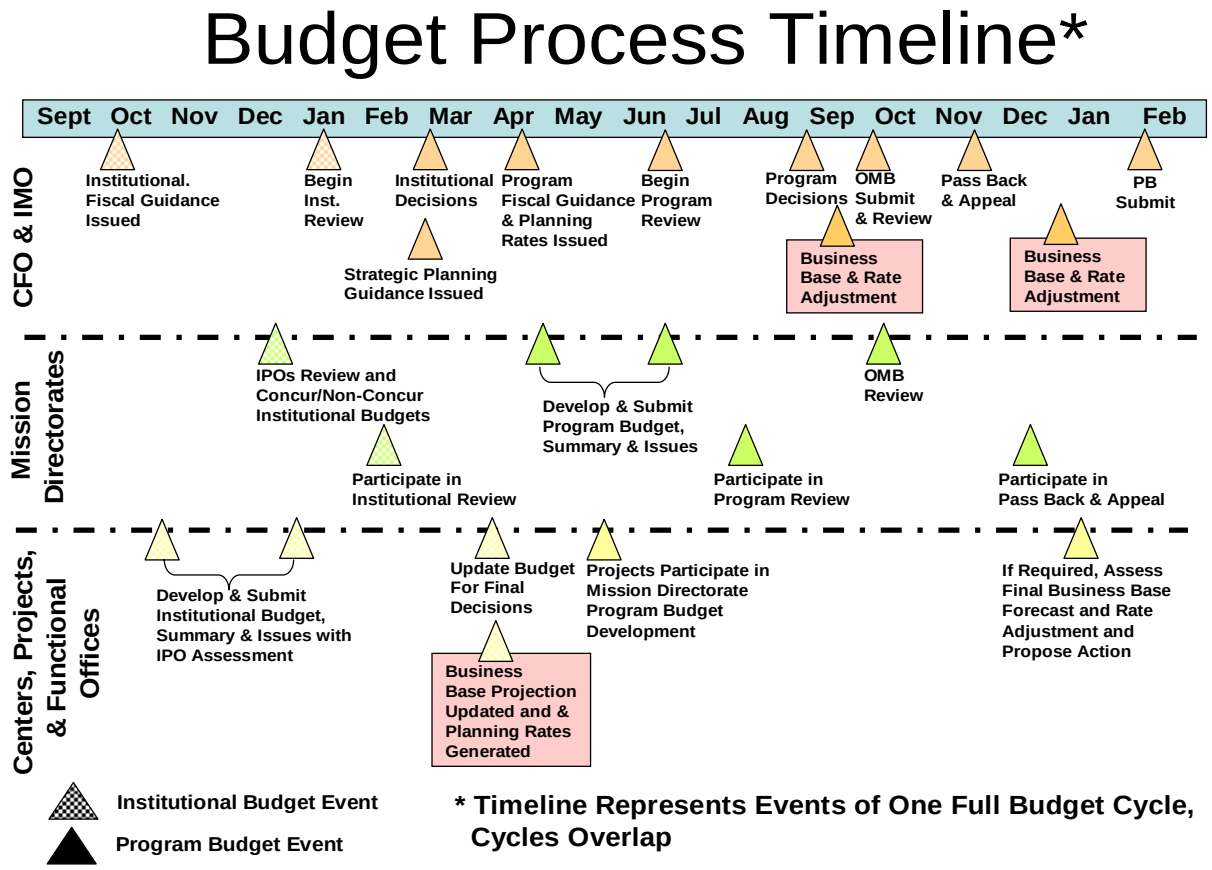


***Figure 3-1**: Budget Cycle (Program Operating Plan Process)*

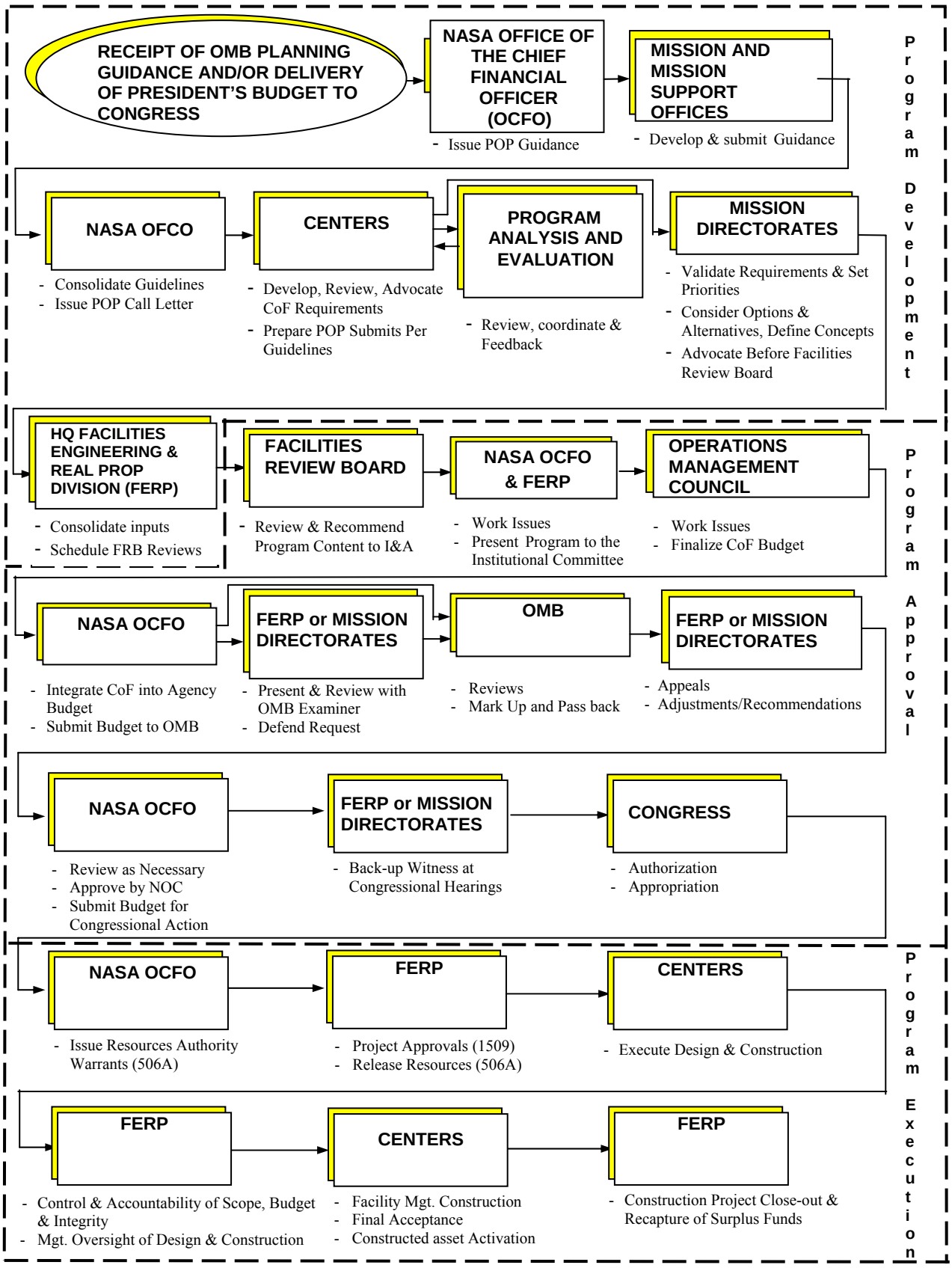


***Figure 3-2**: CoF Program Management*

3.1.3 Major "Discrete" Projects

The Construction of Facilities program addresses program requirements that serve a Federal need that cannot be readily met with existing Federal assets or assets available in the private sector. The prioritization of these projects is done in close coordination with the customer or program area with the requirement. The prioritization of Institutional Discrete CoF projects is done in close coordination with the customer or program area with the requirement (refer to the Institutional CoF Prioritization Process, Section 3.1.1).

Capital planning and budgeting integration (annual work planning) are key components of NASA's current real property management. The capital planning and associated budget integration take place at the Centers and discrete projects are approved at HQ. After the budgets are developed, FERP will annually review their portfolios and plans with NASA HQ executives and Center executives and real property directors to ensure conformance to the agency and federal goals.

The Centers' facilities management organizations perform due diligence to determine the best way to meet the agency's mission needs using engineering studies, requirements documents, project management plans, Project Definition Rating Index (PDRI), life cycle cost analysis, and conceptual designs. These studies define the project, present an evaluation of alternatives to meet mission requirements, alternative cost estimates, construction efforts, acquisition planning and phasing.

Final designs are completed prior to the construction phase of a project to provide more detailed cost estimates, implementation options, design directives, and scheduling and phasing plans.

For example, Requirements Documents which are completed in the early design stage, address the following:

- Project Objective
- Customer Definition and Advocacy
- Constructed asset Operating Parameters
- System Requirements

After completion of the Requirements Document, it undergoes a comprehensive review by the project stakeholders including all functional offices necessary to ensure the project complies with internal and external requirements (e.g. safety, security, energy, legal, planning, acquisition, and environmental).

All projects are required to have a Project Management Plan, which addresses the following areas:

- Identification of the Facility Project Manager and other individuals or organizations responsible for project implementation,
- Description of the functional requirement including the operational need date(s),

- Description of the planned constructed asset including capacity, scope, location, sustainability elements, special features, and Construction Cost Estimate; and, for projects that involve less than the total requirement, the incremental phasing schedule and rationale,
- Identification of all relevant environmental, safety and cultural requirements,
- An acquisition plan ensuring the funding method and schedule to support the operational need date(s),
- A project schedule with key milestones for planning, environmental, design, acquisition, construction, and activation,
- Configuration/change control procedures and responsibilities, and
- Description of design reviews, documentation, fiscal control procedures, and reporting frequency.

For Discrete Projects the Project Management Plan is approved by Headquarters Facilities Engineering & Real Property Division.

NASA uses the PDRI to determine a project's readiness for final design and construction. The PDRI is a checklist used by the Project Manager, project team and customer to determine the areas requiring clarification and further study.

Among the many elements evaluated by the PDRI, the following are a few examples: business strategy, owner philosophies, project requirements, site information, building programming, design parameters, equipment, procurement strategy, deliverables, and project control and execution.

If the PDRI assessment indicates that the project risk is low, then the project may proceed to final design and construction. If the project risk is considered high, then the project team is required to identify the problem areas and evaluate the risks to the overall success of the project.

NASA Headquarters uses a number of criteria to assess the relative priority of projects among the Centers. These include:

- Alignment with the Capital Improvement Plan and Center Master Plan
- Consistency with the overall Agency/Center goals and missions
- High priority for safety, American Disability Act, Security and Sustainability projects
- Impacts of projects on the Facilities Revitalization Rate and Facilities Condition Index
- Impacts of projects on historic and cultural preservation.

NASA FERP Division does not require earned value management (EVM) for facility project management. These contracts are typically too small for EVM to be effective. A large project for facilities is $20-30 M is rare. And, facility contracts are typically fixed price and fixed performance period. These kinds of contracts are not conducive for EVM effectiveness. However, the construction management process required by NPR 8820 accomplishes the same

thing as EVM for all construction and repair projects that are over $500K (i.e., requires tracking of cost, schedule, scope). Additionally, NASA implements construction management best practices wherever possible.

3.1.4 Minor Projects

Similar to the Discrete Projects, NASA Centers perform analyses, and engineering study to develop the Minor Projects for submittal to Facilities Engineering and Real Property Division, using the POP process previously described in Section 3.1. These projects are then assessed by Facilities Engineering and Real Property Division at NASA Headquarters, using the criteria discussed in Section 3.1.1. For Minor Projects, Project Management Plans are approved at the Center level. Requirements Documents and PDRIs are also completed for Minor Projects.

Once final project rankings are established, the budget submittal is completed based upon the amount of funding that is available. Remaining projects are cued up at the Center level for submittal the following year, residual funding if it becomes available, or alternative methods of meeting the need.

3.1.5 Acquisition of Leases

In lieu of construction, NASA sometimes leases assets that belong to private owners or other government entities to satisfy requirements. A lease is used when a business case analysis shows it to be more advantageous based on life cycle and business considerations, normally for short-term requirements. NASA does not typically do a significant amount of leasing. Leases of 5 years or more in term require Headquarters approval. NASA also uses Space Act authority to obtain the use of assets when appropriate. The Space Act is described more fully in the introduction of Section 3.

NASA ensures that leasing proposals conform to OMB's operating lease scoring requirements and examines each leasing proposal for consistency with the portfolio strategy, the availability of space in the local market, and the appropriateness of timing. Projects meeting all applicable criteria are included in NASA's annual budget request to OMB and Congress.

NASA obtains leases in a variety of ways, including using the General Services Administration, with assistance of private real estate services firms, or, in-house personnel. The leases are written and negotiated by the owning Center, following policies and guidance issued by Headquarters. If below 5 years in term, the Center Director also has the authority to sign and execute the lease. NASA solicits offers on a competitive basis, negotiates with offerors, and makes awards to the lowest priced acceptable offer. Some solicitations, known as "Best Value", also consider trade-offs between price and other factors.

3.2 Acquisition Performance Measures and Continuous Monitoring

3.2.1 Federal Real Property Council Acquisition Measures

NASA will adopt the Federal Real Property Council acquisition measures once they have been developed and defined.

3.2.2 Agency Specific Measures

NASA does not acquire a significant amount of new real property. NASA's focus, as previously described, is on re-using existing real property, or utilizing assets owned by others. For this reason, NASA does not track the specific performance of real property acquisition, however, NASA does track specific measures regarding the design and construction process, some of which are discussed below.

3.2.2.1 Construction Acquisition Measure

Appendix A contains the measures used by NASA to evaluate the effectiveness of construction acquisitions, primarily using the standard program management measures of cost, schedule, and scope.

3.2.2.2 Leasing Acquisition Measure

For in leasing, NASA tracks the number of leases and size (square footage) of leased spaces. The goal is to reduce leasing to the extent possible.

3.2.2.3 Enhanced Use Leasing Measure

NASA uses out leasing to generate revenue. Enhanced Use Leasing (EUL) is only for out-leasing, (the lease of NASA property to some party for their use.) The metric that is used to evaluate performance in this area is Outlease Revenue. NASA is seeking an upward trend in Out lease Revenue. In addition, NASA is pursuing legislative action to gain the use of EUL at all ten of the field Centers. See Section 4.4 for a fuller description of EUL. All Centers have authority under the National Historic Preservation Policy Act to lease historic properties and retain revenues received for maintaining those properties.

3.2.2.4 Customer Satisfaction Surveys/Measures

NASA assesses customer satisfaction using two metrics. The performance of construction is assessed with a customer satisfaction survey that addresses the quality, timeliness, budget and schedule. This survey is completed as part of the project closeout process. The results are tabulated each fiscal year at each Field Center and then forwarded to the Facilities Engineering and Real Property Division for assessment. The current goal is to achieve a rating of 75% or higher at each Center.

3.3 Acquisition Initiatives

NASA is striving to improve the delivery of on time, within budget, and within scope capital projects. To accomplish this, NASA has two specific initiatives, specified in the Real Property Management Plan, underway to improve planning and delivery of acquisition projects and to improve financial and program management. The initiatives address (1) Identification and addressing of real property requirements as an integral part of Agency, mission directorate, program, and project planning, (2) Construction and operation of new real property to meet mission requirements only when existing capabilities cannot be effectively used or modified. The milestones associated with these initiatives are detailed in Appendix F, which provides a three-year rolling plan.

Real Property Requirements as Integral Part of Planning

To ensure that NASA appropriately plans for future mission needs it is necessary that Real Property Requirements be developed as early in the planning phase as possible. To effect this change, NASA has modified or is in the process of modifying its policy and procedural requirements.

Construct and Operate New Real Property Only When Absolutely Necessary

NASA will examine all new real property requirements to ensure that only those capabilities that are not available elsewhere are built and operated. Determinations will be made on existing capabilities for effective use if modified: considering advanced technologies to brick and mortar constructed asset solutions, modifying existing NASA real property, leveraging the resources (fiscal and physical) of other federal agencies, industry, and academia.

Section 4. Operations of Real Property

The operations phase of NASA's real property assets involves making decisions regarding maintenance and reinvestment as well as monitoring administration of leases and servicing agency needs. This section describes some of NASA's processes and initiatives regarding the maintenance and operation of its existing assets. Figure 2-6 portrays the decision flow for evaluating existing assets.

4.1 Real Property Inventory

NASA manages more than 360,000 acres of real property and owns 100,000 of those acres. It has approximately 2700 buildings and another 2400 diverse real property assets located around the world. These assets include commercial office buildings, warehouses, testing labs, and wind tunnels to launch pads, antennas, roads, and utilities. In total, they represent more than $20 billion in current replacement value (CRV).

Critical real property information is needed on all assets to support operational decision-making. NASA's Real Property Inventory (RPI) and Facility Utilization System (FUS) provide a web-based automated means for recording, maintaining, and reporting real property data for all assets valued over $5000. It contains basic information on every real property asset owned by under NASA, as well as basic information on leased assets. It provides an automatic mechanism for reporting real property information to NASA Headquarters and General Services Administration (GSA), and assists in the compilation, analysis, and reporting of real property and facility utilization data. The database also catalogs a wealth of information about individual NASA facilities, which is heavily used to manage the real property portfolio.

The NASA RPI is a "real time" database of all constructed assets and land. It is validated annually, with updates and corrections continually applied as necessary. It is flexible, user-friendly, and based on commercial-off-the-shelf software. Section 4.1.1 describes some of the data that is contained in the RPI. The RPI is NASA's fiscal tracking system for real property. All capital acquisitions and changes to capital assets are recorded in the RPI. However, it is not linked directly to the Integrated Financial Management System. The fiscal data in the RPI can be uploaded electronically to the CFO for their use.

4.1.1 Asset Documentation

A "property card" is the basic repository of information on each individual real property asset under NASA management and control that is contained in the RPI. All real property constructed assets with an initial cost or book value of $5,000 or more have property card information in the RPI system. The following data fields are found on the property cards:

- *Property number*. Center-assigned constructed asset number.
- *Property name*. Constructed asset name, which is usually descriptive.

- *Structure*. Type of property: land, buildings, leasehold improvements, other structures and facilities, or leased structures or buildings.
- *Construction*. Type of construction, such as permanent, semi-permanent, and temporary.
- *Card date*. Date on which the property card was originally filled out.
- *Ledger account*. Code obtained from the NASA *Financial Management Manual*, which requires that all NASA real property assets receive a ledger account coding of land, improvements to land, buildings, other structures and facilities, or leasehold improvements. The system automatically assigns this account number when structure type is selected.
- *NASA classification*. Every NASA real property asset is assigned 1 of more than 500 real property classifications. The classification depends on the function or composition of the asset. For example, separate classifications are applied to a concrete or a bituminous runway. NASA Form 1134 lists all classifications. Selection of a NASA classification code drives system selection of the constructed asset capacity in the valuation section of the property card.
- *GSA usage code*. The NASA classification coding system refers the user to the appropriate matching GSA usage code, which is also found in NASA Form 1134.
- *Land area type*. Information on the type of land involved, whether rural or urban. When the property card is for a constructed asset (as opposed to land), the usual entry is null.
- *NASA interest*. Basis on which NASA uses and controls the property. Typical entries are owned, leased, or use permit.
- *Status*. Assets may be classified as either active or inactive. If inactive, they are further designated as standby, mothballed, or abandoned.
- *Utilization level*. Facilities may be classified as over-utilized, utilized, under-utilized, or not utilized.
- *Description*. Description of the constructed asset and its location, with sufficient detail to allow someone who is unfamiliar with the constructed asset to locate and identify it.
- *Inventory dates*. Date when an inventory of the constructed asset was last conducted and the performing organization (NASA or GSA).
- *Valuations*. Cost and size information concerning the constructed asset. The book cost of the constructed asset is the cost to acquire or construct the constructed asset. Also included in book cost are all costs necessary to bring the constructed asset to a form and location suitable for its intended purpose (that is, the total cost to NASA). Book cost represents the original capitalized value of the asset, adjusted for modifications. (The recorded book cost is updated annually by the cost of any additions, modifications, or demolitions of $5,000 or more.)

  The database automatically generates the Current Replacement Value (CRV) by escalating its book value of the constructed asset using the *Engineering News Record* (ENR) annual 20-cities average building cost index (BCI) factors. The CRV calculations are made by indexing the construction cost using the BCI value for the year of construction, indexing each change in book value using the BCI value for the year in which the change was made,

and then summing the results. By clicking on the CRV button, the user can also view the CRV in past years and the CRV if one of the individual listed city's BCI were used instead of the 20-cities average. The "Plant Replacement Value" (PRV) will be added to the RPI; it is the cost to replace a constructed asset to meet current requirements.

The valuations field also records the constructed asset's original and current capacity, and its original and current size. The database automatically inserts the unit of measure for the constructed asset's capacity, depending on its NASA classification. For example, a runway's capacity is measured in square yards, buildings in square feet, liquid storage tanks in gallons, liquid pumping facilities in gallons per minute and electric power plants in kilowatts. When a Center's real property data administrator enters the correct NASA classification for the constructed asset into the property card, the database automatically inserts the correct unit of measure for that classification. A click on the unit of measure listed on the property card converts the measurement, where appropriate, from the English system to the metric system.

- *Transaction activity*. Record transaction activities greater than $5,000 concerning the constructed asset. These transaction activities include modifications or renovations to the constructed asset, adjustments to capitalization costs (book value), and transfers of management or control of the constructed asset.
- *Constructed asset photo*. Photograph of the constructed asset.

4.1.2 Other Real Property Inventory Features

The RPI can produce a number of useful standard reports for the real property portfolio. NASA uses these reports to track real property status and to make decisions regarding real property management. In addition to standard reports, the RPI can produce custom reports relatively quickly and simply. Some of the standard reports contained in the RPI include:

- GSA 1166 Annual Data Transfer (This feature is currently in XML format and will be updated to include new requirements.)
- Summary Report By Site
- NASA Property Class Codes Aggregate Report
- Land Summary By Site
- CRV 4-Year Projections
- Property Listing By Site
- In/Out Grant Report (includes EUL Leases as out grants)
- Floor/Space Age Factor Data
- Building Space Utilization Report
- Major Facilities Utilization Report
- Facilities Not Needed/Underutilized
- Constructed asset Data Summary

The RPI is being improved by the addition of data elements in support of the Federal Real Property Council (FRPC) performance measures and inventory guidance. Recent enhancements to the NASA real property database include the addition or modification of the following data elements:

- condition index (CI), as defined by the FRPC;
- utilization, as defined by the FRPC - initially, utilization will be a fairly subjective determination by the owning Centers, with spot checks by Headquarters, and will use the four categories issued by the FRPC;
- O&M costs;
- mission dependency index (MDI) - initially mission dependency will be a fairly subjective determination by the owning Centers, with spot checks by Headquarters, and will be categorized into "mission critical," "mission dependent, not critical," and "not mission dependent" per FRPC guidance. NASA is developing a more objective MDI that will produce a score with a 0-100 scale;
- historical status;
- plant replacement value (PRV) – currently under development;
- repair needs (based on NASA's Deferred Maintenance assessments and used to calculate the CI); and
- Facility Sustainment Model data.

The Facility Utilization System, a part of the RPI, contains information on how the asset is being used, such as site closure reports, property utilization reviews, and data on the various classes of personnel using a constructed asset's space. Originally intended to comply with NASA's real property recording and reporting requirements (in lieu of paper records), RPI/FUS is now used for many other purposes, such as for financial capital asset reporting and for supporting parametric models that are used to estimate facility sustainment and deferred maintenance costs.

4.2 Historic Preservation

In addition to providing procedures to the requirements of the National Environmental Policy Act (NEPA), NPR 8580.1, Implementing the National Environmental Policy Act and Executive Order 12114 also include procedures to comply with the requirements of the National Historic Preservation Act of 1966, as amended, and Executive Orders 11593 (Protection And Enhancement Of The Cultural Environment), 13006 (Locating Federal Facilities on Historic Properties in Our Nation's Central Cities), and 13287 (Preserve America). This RPI data element will be used to monitor and report on the condition of NASA's historic resources and assets in accordance with EO 13287, Preserve America. It is also an essential component in establishing and tracking Integrated Cultural Resource Management Plans (ICRMPs) for each Center.
The National Historic Preservation Act (NHPA) establishes the National Register of Historic Places (National Register) and requires Federal agencies to consider the effects of their actions on cultural resources that are listed or are eligible for listing in the National Register. To evaluate

possible effects of the proposed actions, the implementing regulations of Section 106 of the National Historic Preservation Act require agencies to identify and evaluate historic resources, assess the area of potential effect (APE) of the proposed action on the historic resources, consult with the State Historic Preservation Office (SHPO), and solicit comments from the Advisory Council on Historic Preservation in certain instances. The purpose of this act is to protect historic resources in the project areas that are listed in or eligible for listing in the National Register. Such listings can include districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture. Recent amendments to NHPA emphasize the need to solicit concerns from Native Americans to protect traditional religions and culturally important properties.

NASA assesses its constructed assets for historic significance as necessary. NASA recently added a data element to the RPI to characterize each asset's historical designation status as "National Landmark," "Listed on National Historical Register," "Eligible for Listing," "Not Eligible" (or "evaluated, not historic") "Not Surveyed" (or "not evaluated") and "Not Applicable." These characterizations will be reviewed annually and changed as necessary ensure compliance with FRPC inventory requirements and appropriate management of historic assets.

4.3 Asset Business Plans

While NASA does not prepare individual business plans for each constructed asset, each Center prepares Center Master Plans, which flow from Mission Directorate Implementation Plans, the Agency's Institutional Implementation Plan and the Strategic Plan. This series of plans form the NASA real property asset business planning process. Additionally, NASA has recently instituted a requirement for business case plans to be prepared and approved in specific cases, including new construction or major acquisitions, major leases, significant disposal actions, and other major real property actions. Therefore, the Centers, via the Agency's implementation plans and Facility Master Plans, are considered the "building blocks" for NASA asset business plans.

4.3.1 NASA Strategic Plan

As stated in Section 2.3, asset management decision-making begins with strategic planning. The Agency Strategic Plan sets the course for the Agency, establishes the highest-level metrics against which to measure performance, and is the foundation for all other plans in NASA. Figure 4-1 illustrates the relationship between external requirements and internal documents. The NASA Strategic Management and Governance Handbook, NPR 1000, (http://nodis3.gsfc.nasa.gov/StrategicManagementandGovernanceHandbook) provides detail about how high level Agency strategies are turned into executable programs and projects with supporting budgets. Within the strategic planning process, Agency-level strategies are derived from the top-level Implementation Plans. NASA currently uses the RPMP as the strategic planning document for making real property decisions. In the near future, the RPMP will be subsumed by the Agency's Institutional Implementation Plan. In support of the Agency's Institutional Implementation Plan, each Center is required to develop a detailed Center Master Plan that is required to be updated at minimum of every 3 years. These plans comprise NASA's Asset Business Plans.

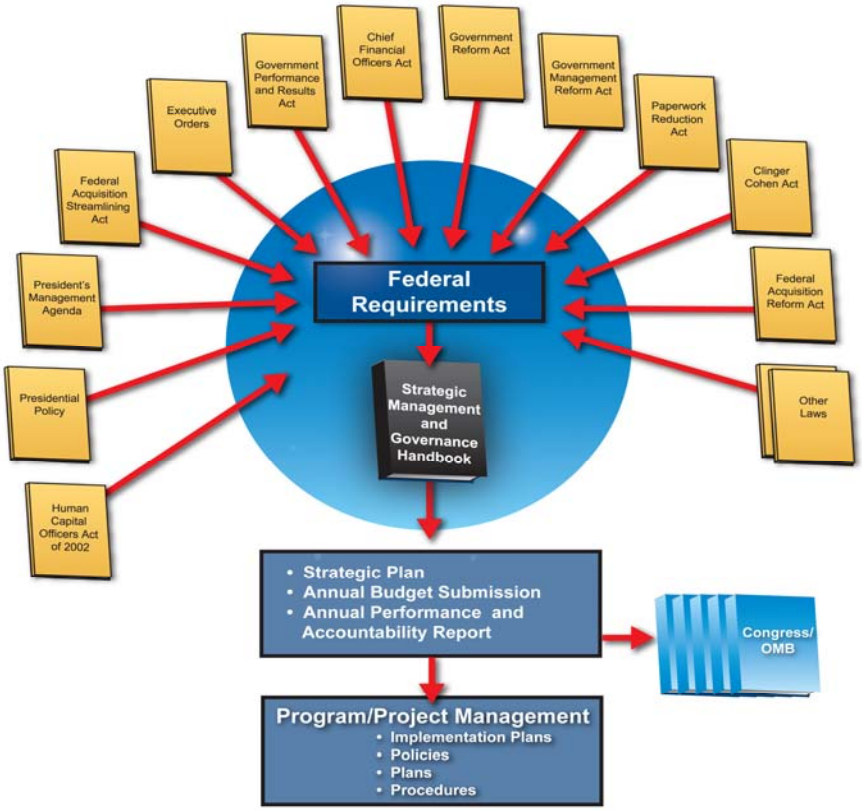


***Figure 4-1**: Strategic Planning and Governance Documents*

4.3.2 Institutional Implementation Plan

Once the Strategic Plan is approved, each Mission Directorate develops one Implementation Plan to carry out the Strategic Plan. All institutional offices contribute to one Institutional Plan. The Institutional Implementation Plan will take into account all relevant information from the Annual Budget and the Integrated Budget and Performance Document. The Institutional Implementation Plan will serve as the bridge between strategic planning and execution of the Center Master Plan. A NASA Procedural Requirements document will be developed that describes the process and procedures for developing the Implementation Plan.

4.3.3 Center Master Plans

Centers are responsible for establishing and maintaining the institutional capabilities (human capital, facilities, processes, etc.) required for programs, projects, and missions. Each Center prepares and maintains a Center Master Plan (CMP) in accordance with NASA Policy Directive

NPD 8810
(http://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PD_8810_0002_&page_name=main) and NASA Procedures Requirements NPR 8810 - Master Planning for Real Property (http://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PR_8810_0001_&page_name=main). The CMP is the Center's statement of its concept for the orderly management and future development of the Center's real property assets, including land, buildings, physical resources, and infrastructure. It is the overall plan for Center development. It provides a narrative, statistical, and a graphic record of current capabilities and conditions (natural features, buildings, structures, utilities, transportation systems and other improvements), as well as proposed conceptual capabilities necessary to support program requirements, mission requirements, and the NASA Strategic Plan.

The CMP is integrated with and supports Mission Directorate Implementation Plans, the Agency's Institutional Implementation Plan, the Real Property Management Plan and the Strategic Plan. The CMP is prepared in accordance with applicable NASA implementing guidelines and other planning processes, including environmental planning. The CMP ensures compliance with real property requirements established by pertinent statutes and regulations, Office of Management and Budget circulars, Executive orders, and Agency directives and guidance. Finally, Center Master Plans will be developed, maintained and periodically reviewed to ensure the future physical development of each Center supports the NASA Mission.

4.4 Periodic Evaluation of Assets

4.4.1 Evaluation of Real Property to Ensure Alignment with NASA Mission

NASA's Real Property Management Plan addresses the periodic evaluation of assets. Real Property Goal 3 states that, "NASA will continually evaluate its real property assets to ensure alignment with the NASA Mission." To accomplish this goal, NASA identifies and addresses real property requirements as an integral part of strategic planning. The Agency will continually assess the mission requirements in regards to its supporting real property, and will perform an analysis that correlates mission requirements with real property infrastructure approximately every 3 years. The Center Master Plans are also mission-requirement driven.

Through periodic evaluations, NASA will identify real property capability gaps and determine how to fulfill the capability; identify and eliminate redundant and excess real property capabilities; and demolish or deconstruct unneeded facilities. These will be accomplished in conformance with real property policies, annual budget guidance, and using tools such as the Agency demolition fund.

In addition, as discussed in Section 2.4.2, with the establishment of the Shared Capability Assets Program and separate Headquarters programming and budgeting process, NASA will assess and prioritize its critical assets in order to make strategic investment decisions. The Program will ensure that facilities and capabilities vital to NASA's success will be sustained for the customers who need them. NASA's Office of Program Assessment and Evaluation will provide advice, and independent assessment of the proposed candidate capabilities.

In support of these efforts, NASA developed an asset disposition process that all potential users and customers will use to determine if an asset is needed or if it is ready for disposal (see Section 5). Based on any decision to place a facility into an inactive status and any subsequent demolition or disposal through transfer or sale, the Center will update the RPI database. This will ensure the accuracy of the database and enhance and ensure that FRPC guidance is followed.

4.4.2 Annual Condition Assessment Surveys of Real Property

NASA's facility condition index (FCI) is a general measure of constructed asset condition at a specific point in time. It is measured on a 5-point scale: 5 is a like-new constructed asset that has little or no repair requirements, and 1 is a constructed asset that should be or has been condemned. Assets with an FCI of 3 or lower are considered in poor condition. NASA performs condition assessment surveys annually of all NASA constructed assets to quantify our repair, or deferred maintenance (DM), needs. DM and FCI determinations are based on a parametric model that assigns a system condition index (SCI) to nine major systems in each NASA constructed asset. It is calculated as the weighted average of the systems' condition ratings. NASA also use FCI to track constructed asset condition as a basis for major repair funding by estimating the funding required to raise the NASA average FCI to a target FCI goal. The NASA FCI and DM models are also used to calculate the Condition Index (CI) that conforms to FRPC guidance.

The NASA model was developed following an extensive review of existing practices in Government, academia and the private sector. The 5-point scale was chosen as a simple rating measure which could be defined and quickly scored by visual inspection. It's very similar to the quick, but accurate decision a professional car buyer must make at the car auction because the decision to bid to bid is based upon visual inspection without test driving or other diagnostic procedures. NASA has validated the model by direct comparison with the USACE developed BUILDER and the commercial VFA Facilities model as well as less rigorous comparisons with other models. The NASA model is based upon many features of the USACE PACES model and the DoD Facility Sustainment model.

NASA tracks the financial performance of its assets using several key performance measures including the Facility Revitalization Rate (FRR), percentage of programs out of annual cycle on a dollar basis, outleasing revenue, and obligation rates. Current performance is to be compared against performance goals from public sector benchmarks, previously established performance criteria, or individual performance measure goals. NASA regularly works with the Federal Facilities Council, the National Institute of Building Sciences, the Construction Industry Institute, the National Science and Technology Council's Physical Infrastructure and Systems Security Working Group, the Association of Facility Engineers (and other groups) to compare its performance and identify "best practices".

4.5 Re-Use of Underutilized Property

NASA continues to encourage re-use and disposal of real property assets to the maximum extent possible. NASA also continues to take advantage of opportunities to consolidate, vacate, and otherwise reduce the need for real property, and pursue innovative disposal actions. NASA has

been given authority to implement Enhanced-Use Leasing (EUL) at two Centers (Ames Research Center and Kennedy Space Center) which allows them to re-use their underutilized assets. NASA is pursuing expansion of EUL authority to include all Centers. Agencywide EUL authority would allow NASA to better manage its entire real property portfolio. EUL allows NASA to out-lease underutilized property, saving operations and maintenance costs and potentially bringing in additional revenue that can be used to maintain and repair existing real property assets. NASA is seeking legislative approval for a comprehensive EUL authority.

4.6 Operations and Maintenance Plan

NASA's goal is to improve the institutional management of the Agency's capital assets. NASA's policy includes ensuring that NASA owned and operated assets are properly aligned with the NASA mission and are in operating condition (except for facilities in "mothballed" status).

NASA does not prepare annual Operations and Maintenance (O&M) plans for its constructed asset process, but the Centers do prepare Annual Work Plans (AWPs) for their maintenance and repair programs. Additionally, NASA is managing via "full cost management," which provides visibility into the full cost of O&M at each asset. Under full cost management, tenants on NASA Centers, including NASA Programs, must pay a charge for occupying or using a constructed asset. The amount required to support the constructed assets for the following budget year and estimated for future years is developed during the annual POP process. It is a bottom up budget process that results in O&M spending plans.

4.6.1 Maintenance

To determine annual maintenance requirements, NASA uses three "measures:" the Facility Sustainment Model, a parametric model developed by the Department of Defense and adapted by NASA for its use; the 2% - 4% of CRV model developed by the National Research Council; and a bottoms-up unconstrained report from the Centers. NASA compares these requirements measurement tools to the amount of funding proposed by the Centers, and makes determinations regarding the annual constructed asset maintenance levels. As part of this assessment, NASA tracks the facility condition index; Section 4.7.2 describes the FCI performance measure objectives in further detail.

NASA's facilities and equipment are maintained in the most cost-effective fashion available that minimizes risk to processes and products, protects the safety and health of personnel and the environment, protects and preserves capabilities and capital investments, provides quality work places for NASA employees, and enables the Agency's mission.

NASA applies the reliability-centered maintenance (RCM) approach that employs a full range of maintenance strategies varying from "run to failure" to "streamlined failure mode and effects analysis (FMEA) combined with predictive testing and inspection (PT&I)" to institutional and program facilities and related equipment. NASA's procedural requirement Facilities Maintenance Management NPR 8831.2D describes the RCM philosophy, principles, requirements analysis, failure identification, program benefits, impact on facilities life cycle, and program components. (See Chapter 7: "Reliability Centered Maintenance" Section 7.9 "Other RCM Applications."

(http://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PR_8831_002D_&page_name=main.)

The Centers:

(1) Use state-of-the-art management techniques that optimize maintenance activities with respect to risk management and cost. These principles are outlined in the NASA Reliability Centered Maintenance Guide and the NASA Reliability Centered Building and Equipment Acceptance Guide. Both can be found at http://www.hq.nasa.gov/office/codej/codejx/jxdocuments.htm#premtdocs. The Maintenance Guide contains samples contract clauses that can be used for facilities planning, design, new construction, modification, equipment procurement, and M&O contracts. The Equipment Acceptance Guide provides criteria based on RCM principles for equipment acceptance.

(2) Use accepted standards as guidelines to determine facilities and equipment maintenance funding requirements when a detailed requirements and associated estimates are not available.

(3) Generate, tracking, trending, and managing facilities maintenance activities by using appropriate performance metrics to enable overall maintenance program review and continuous improvement.

(4) Undertake benchmarking activities resulting in the identifying, sharing, and implementing of "best practices." A partial best practice list includes NASA Construction of Facilities (CoF) best practices, construction safety best practices (as a result of Construction Industry Institute information), maintenance best practices such as RCM, predictive testing and inspection, and reliability centered building and equipment acceptance (RCB&EA). Other best practices include utilization of an on-line real property inventory system (RPI), guide performance work statement (GPWS), continual analysis of internal functions and data for trending, use of a facility sustainment model (FSM), and continual training. A more comprehensive list is provided in Appendix B.

(5) Ensure that each Center develop and monitor the performance of an Annual Work Plan (AWP) that defines and quantifies, in terms of budget dollars and/or workforce estimates, all scheduled maintenance to be accomplished in the following fiscal year and documenting all accomplishments in the current year. Annual maintenance and repair plans/proposals for institutional and program facilities and related equipment reflect the level of activity necessary to arrest annual growth of deferred maintenance, such as at the level indicated by the Facility Sustainment Model. The AWP addresses:

a. preventive maintenance, programmed maintenance, repair, and replacement of obsolete items.
b. projected deferred maintenance, and/or backlog of maintenance and repairs.
c. projected operating costs for central utility plants and other services such as grounds care.
d. allocations for nonscheduled work: trouble calls, emergency work, and non-maintenance service requests.

(6) Account for facilities and equipment maintenance and repair expenditures in accordance with the NASA Financial Management Manual - Agency wide Coding Structure - FMM 9100 series.

(7) Assess constructed asset and equipment conditions by participating in the application of the NASA Deferred Maintenance Parametric Estimating Guide. Scheduled and unscheduled maintenance and repair visits are also used to record condition codes of facilities and equipment for use in the Computerized Maintenance Management System (http://www.hq.nasa.gov/office/codej/codejx/DefMaintFinalReport&Guide.pdf). This parametric estimating model determines the level of deferred maintenance within NASA's inventory of facilities. It is based on condition assessments of nine primary facility systems, and enables a repeatable, auditable, near 100% survey of NASA real property within a limited timeframe and budget. The model rapidly assesses the overall condition of each facility in NASA's inventory and produces a consistent, repeatable, auditable deferred maintenance estimate.
(8) Use Performance-Based Contracting (PBC) and best-value principles to the maximum extent feasible and practical to shift the appropriate degree of cost risk to contractors and maximize competitive pricing.

The AWP provides a guide for the year's activity to ensure that NASA Center and Agency priorities are followed and the maintenance program progresses in a proactive versus a reactive mode of operation. The AWP balances estimated emergency and urgent reactive maintenance with predefined RCM activities such as Programmed Maintenance, PT&I, preventive maintenance, and proactive maintenance. The plan promotes the adoption of new maintenance technologies and documents the maintenance requirements for the year.

The AWP is a compilation of all maintenance and repair work to be accomplished during the year, including an estimate for unforeseen work. This compilation is the result of analyzing the total work requirements and integrating them with the budget.

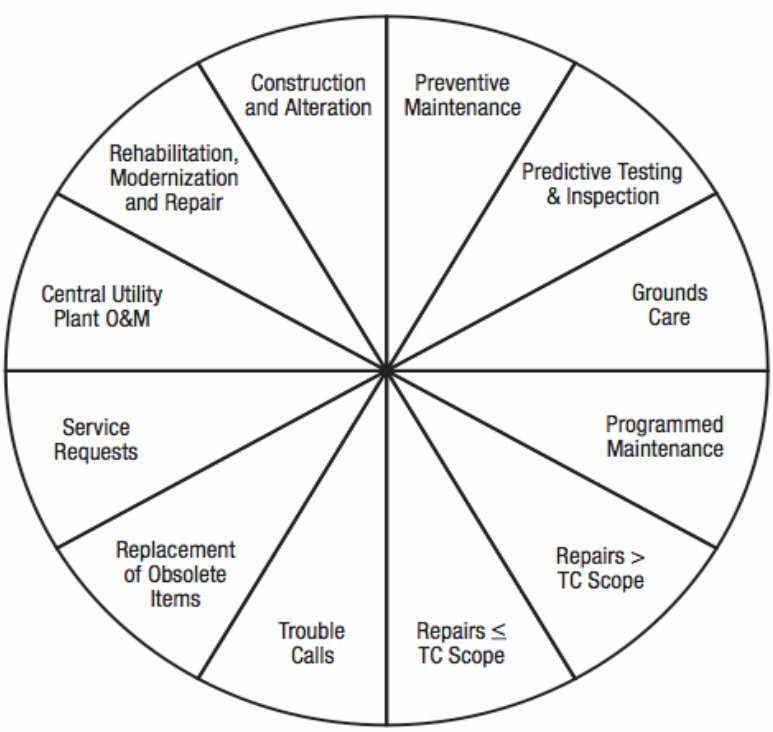


***Figure 4-2**: Elements of the Annual Work Plan*

Figure 4-2 shows the specific elements composed in the facilities maintenance AWP. Cumulatively, the elements define the total facilities maintenance program planned at a Center for a given year and the estimated cost in dollars and other resources (manpower, materials, and equipment).

The AWP contains specific information that is obtained from the Real Property Inventory, coupled with the RCM database. This information is augmented by a variety of files and other key documents, including the Agency Strategic Plan, Center Implementation Plans, Center Master Plan, PM requirements, a continuous inspection program, historical funding data, Energy Efficiency and Water Conservation 5-year Plan, and facilities history records.

The Computerized Maintenance Management Software (CMMS) and Computer Aided Facility Management (CAFM) are electronic systems used to provide information about constructed asset and equipment maintenance histories, criticality codes, priorities, performance metrics, trouble call histories and other unforeseen requirements on which to base a reasonable estimate of the required level of effort for each season of the year. Each Center maintains its own CMMS and CAFM systems. Procedural requirements on the use of these systems may be found in NPR 8831, Facilities Maintenance Management (http://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PR_8831_002D_&page_name=Chp6).

The above requirements are detailed in NASA Policy Documents and Procedural Requirements library (http://nodis3.gsfc.nasa.gov/main_lib.html).

4.6.2 Operations

While specific operations plans are not mandated, the Centers must determine the operations requirements during the budget process, track operations expenditures, and implement best practices for operations to the maximum extent possible. Under full cost management, operations costs are allocated to the tenants and users of NASA constructed assets by the Centers. Contractors at the Centers perform most operations and maintenance activities, with most Centers awarding multi-year Center Operations Support Contracts that cover operations, maintenance, minor repairs, and other routine Center operations. NASA Center facilities personnel develop the contract requirements, in conjunction with NASA procurement specialists, for Center operations based on the Center business bases and operations and maintenance needs. The contracts are typically performance-based, combination fixed-price and award-fee, and are monitored closely by Center personnel.

The largest cost of operations is utilities. NASA tracks and reports its energy use and energy conservation goals continuously per requirements by Executive Order and law. NASA strives to lower the cost of utilities through the implementation of conservation practices and technology. NASA has also mandated a minimum of Silver rating under the Leadership of Energy and Environmental Design (LEED) program issued by the U.S. Green Building Council. This sustainable design policy ensures that NASA's new construction and major renovations result in the most operationally efficient asset possible and affordable.

NASA also encourages demolition and closure of unneeded, old and inefficient assets to lower NASA's operations costs. NASA is developing a constructed asset closure plan (see Section 5).

NASA is collecting Operations and Maintenance costs at the constructed asset level effective FY 2005 (using FY 2004 actual data). Once the data is collected, NASA will analyze it and benchmark against available public and private sector data. This benchmarking activity will lead NASA to potential improvements in asset operations and maintenance. NASA will collect the cost and benchmarking data annually as part of the POP process.

4.7 Plan for Basic Repair and Alterations Needs and Capital and Operating Resource Requirements

Based upon appropriations, NASA allocates its budget by first ensuring that all operating expenses are funded. These include all of the contract costs for leases and operating expenses in the O&M Plan for buildings/assets such as cleaning, maintenance, and utilities. It also includes additional contractual obligations for purchase contracts and all overhead items like salaries, training, travel, IT, and other contracts necessary to help NASA run its business. The remaining dollars (typically on the order of $200 million) are divided between the discrete and minor projects in the Construction of Facilities Program to fund the Capital Improvement Plan.

Capital repair projects (over $500 thousand) are proposed by the Centers to Headquarters each year based on their needs and budget guidelines. Projects are evaluated and prioritized at an Agency level based on the needs of the Agency, normally including the following factors:

- Mission criticality
- Center priority
- Mission Directorate priority
- Safety
- Security and Health
- Sustainability (environmental and energy factors)
- Accessibility
- Design readiness
- Facilities Engineering Division assessment
- Deferred Maintenance reduction

The result is a 5-year repair funds allocation plan. The plans for FY 2005, FY 2006 and FY 2007 are shown in Appendices C, D and E respectively. Additionally, NASA is in the process of preparing an Agency 6-year Capital Improvement Plan as described in Section 3.1.

4.8 Operations Performance Measures and Continuous Monitoring

4.8.1 Operations Performance Measures

NASA uses performance measures to evaluate program performance and effectiveness. For example, NASA annually evaluates its progress in achieving the energy reduction goals as mandated by Executive Orders and the National Energy Conservation Policy Act. Figure 4-3 shows NASA's execution with respect to the 2005 goal of 30 percent reduction over the 1985 baseline for Non-Mission Variable Buildings.

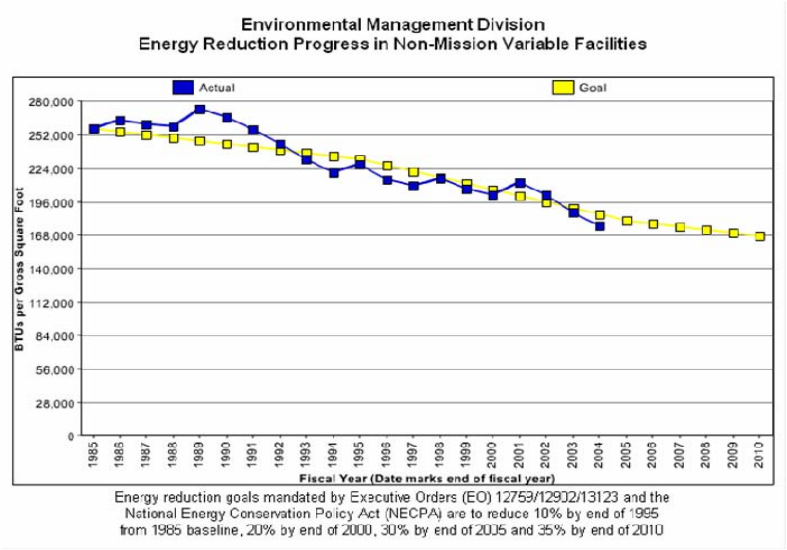


***Figure 4-3**: NASA Energy Reduction Progress*

Other examples of measures in use include the following:

- Utility consumption: as discussed above, NASA tracks utility consumption with a goal towards continual reduction in consumption and costs.
- O&M costs: NASA has tracked maintenance costs annually, but will also begin tracking operations costs. A rising trend in costs will trigger analyses of the reasons and potential implementation of cost-saving initiatives.
- Customer Satisfaction Index. It is a 2-tiered rating gauging the effectiveness of the constructed asset in meeting the mission requirement and/or the needs of the individual building tenants. This may include ratings received by the Facilities Engineering and Real Property Division from the annual departmental survey. The ratings include red (for declining trend), yellow (for steady state), and green (for improving trend).

4.8.2 Federal Real Property Council Measures

4.8.2.1 Condition Index

NASA has adopted the FRPC definition of condition index calculated as follows:

(1 – (repair needs/plant replacement value)) * 100

NASA uses its Deferred Maintenance to determine repair needs. With its current DM at about 1.77B and repair value of approximately $23B, NASA's condition index is approximately a 92, or "fair" condition. NASA is currently evaluating setting a condition index goal that will be based on NASA requirements and budget affordability.

4.8.2.2 Facility Utilization

Currently, NASA tracks utilization in the Real Property Inventory as described earlier. NASA also uses the Facility Utilization System (FUS) to track "Equivalent Use Days" of its major facilities.

NASA's utilization data is based on the FRPC's latest standards. The vacancy rate derived from this calculation is tracked by asset and used as a part of annual performance measures. As the FRPC further defines utilization, NASA will work to ensure consistency with the standards. NASA will initially use the categories and percentage utilization shown in Table 4-1 to determine asset utilization to the extent possible.

Category	Overutilized	Utilized	Underutilized	Not utilized
Offices[a]	>95	75–95	<75	Not applicable
Warehouses[b]	>85	50–85	10–50	<10
Hospitals[c]	>95	70–95	25–70	<25
Laboratories[d]	>85	60–85	30–60	<30
Housing[e]	Not applicable	85–100	<85	Not applicable

[a] Ratio of occupancy to current design capacity.

[b] Ratio of gross square feet occupied to current design capacity.

[c] Ratio of occupancy to current design capacity.

[d] Ratio of active units to current design capacity.

[e] Percentage of individual units occupied. It does not need to be reported at the individual housing unit level, but the manner in which NASA measure and report it should be determined in consultation with OMB.

***Table 4-1**: FRPC Facility Utilization (%)*

4.8.2.3 Operating Costs

NASA is collecting operating and maintenance costs as described earlier. As the FRPC further defines O&M costs, NASA will work to ensure consistency with standards.

4.8.2.4 Mission Dependency

Mission dependency is the value an asset brings to the performance of the mission, as determined by the governing body. Consistent with the FRPC's latest standards, NASA divides assets into the following categories:

- *Mission critical:* Without the constructed asset or parcel of land, the mission is compromised.
- *Mission dependent, not critical:* Does not fit into the mission-critical or not-mission-dependent categories.
- *Not mission dependent:* Does not affect the mission.

NASA is in the process of developing a more objective, numerical mission dependency index for all real property assets to assist in determining mission dependency.

4.8.3 Agency Specific Measures

In addition to the four measures recommended by the FRPC, NASA has developed other measures (refer to Appendix A for details) for financial performance, asset condition and value, operating efficiency, and disposition. These measures include:

Financial Performance
NASA has several key performance measures designed to track financial performance. These measures include the Facility Revitalization Rate, percentage of programs out of annual cycle, outleasing revenue, and obligation rates.

Facility Condition Index

NASA's facility condition index (FCI) is a general measure of constructed asset condition at a specific point in time. It is measure on a 5-point scale: 5 is a like-new constructed asset that has little or no repair requirements, and 1 is a constructed asset that should be or has been condemned. FCI is a parametric model that assigns a system condition index (SCI) to nine major systems in each NASA constructed asset. It is calculated as the weighted average of the systems' condition ratings. NASA also use FCI to track constructed asset condition as a basis for major repair funding by estimating the funding required to raise the NASA average FCI to a target FCI goal. NASA's overall average FCI is currently at 3.7 with a stated goal of 4.3.

Facility Sustainment Model

NASA senior managers have traditionally asked what would be the annual cost to perform maintenance on facilities from actual requirements or from zero-based methods. Because of the cost of manpower and time required, NASA facilities engineering and real property staff were unable to perform this detailed cost buildup. Therefore, NASA used the National Research Council recommendation to spend between 2-4% of the current replacement value (CRV) on facility maintenance each year - the benchmark for federal facilities maintenance. Over the last few years the Department of Defense (DOD) developed its Facility Sustainment Model (FSM), a parametric estimating tool for forecasting maintenance funding annual requirements for their facilities, and NASA now uses this model. The 2003 and 2004 reports and the link to DoD are located at http://www.hq.nasa.gov/office/codej/codejx/codejx.html.

NASA uses this parametric model to determine its minimum constructed asset maintenance requirements. The model considers the type and size of facilities managed and draws upon a large database of facilities sustainment costs. NASA compares maintenance funding to the FSM to determine "facility sustainment rate."

Maintenance Measures

NASA collects numerous measures tracking the performance of the Center maintenance programs. Several are listed below (also see Appendix A):

- Size of real property inventory: NASA annually reviews the value and size (number of assets, square footage, value of assets) to track the progress of programs such as the demolition program, and conformance to this plan. A rise in this measure would indicate that new acquisition is outpacing disposals and may be placing additional burden on NASA infrastructure.
- Percentage of assets underutilized (of the entire portfolio): goal is to increase utilization through consolidations, use of existing assets for new requirements, out leasing, and disposal of unneeded assets.
- Sustainment rate (sustainment funding divided by FSM and sustainment funding divided by CRV): NASA is working to increase the sustainment rate by increasing available funding for maintenance and repair as well as reducing requirements by reducing the overall inventory.

- Demolition execution and outstanding requirements (number and size of assets demolished or awaiting demolition): NASA is tracking its central demolition program to track progress towards disposing of aged, deteriorated, unneeded assets which in turn reduces the requirements for maintenance and operations funding.
- New construction-to-renovation ratio; in accordance with this plan, new construction is the last option. This measure indicates NASA conformance to the plan by measuring the renovation and re-use of assets versus new construction. The goal is to maintain a low ratio. It is measured primarily in number of construction versus number of renovation projects.
- New construction-to-disposal ratio: similar to the above measures, this ration can indicate the success of implementing the goals of this plan to reduce real property size.
- Percentage of RPBP initiatives implemented: this is a measure of the success of taking advantages of the real property opportunities identified by the Real Property Business Plan, which is incorporated as part of this plan.
- Percentage of new construction or major renovation projects that meet LEED silver status: compliance with sustainable design concepts is important to NASA as it has been shown by industry to lead to long term life cycle cost savings. NASA policy dictates the achievement of LEED Silver certification for all new construction and major renovation projects. This measure tracks the success of NASA meeting this policy. Future measures will be employed to measure the long-term benefits of sustainable design.

4.9 Operations Initiatives

NASA is in the early stages of collecting operations and maintenance costs. As NASA collects and benchmarks O&M over the next few years, improvement initiatives will be developed as necessary and operating efficiency will be tracked. NASA has the following initiatives in place now:

- Sustainability: NASA has mandated a LEED Silver rating for all new construction and major renovations to increase maintainability, energy efficiency, and employee productivity, and reduce other costs such as water consumption.
- Energy Conservation: In addition to CoF projects, NASA is actively employing alternative financing mechanisms, such as use of Energy Performance Savings Contracts and Utility Energy-Efficiency Service Contracts, to reduce energy consumption and demand.
- Reliability Centered Maintenance: As described above, RCM reduces the cost of standard maintenance and repair.
- Performance Based Contracting: NASA encourages the use of performance based contracts to improve operations and maintenance performance by contractors.

Section 5. Disposal of Unneeded Real Property

5.1 Tools to Support Decision-Making

When an asset is determined to no longer meet the customer/mission needs, often through the decision processes outlined in Section 2.4.2 and Figure 2-7, NASA pursues redeployment, demolition or replacement of the asset. NASA evaluates the asset considering the following factors:

- Current and long range customer mission needs
- Uniqueness: Is the asset 'one of a kind?'
- Value (cost to replace)
- Cost to maintain (life cycle analysis) and cost to re-establish function
- Condition of the asset
- Community considerations and local planning objectives
- Stewardship issues such as historic preservation, environmental impact and national location policy (e.g., Executive Orders 12072 and 13006.)
- Available alternative solutions

NASA uses the above factors along with other analysis and programmatic considerations, to make final determinations about retention or disposal of a particular asset. Asset disposition is normally accomplished through the POP process, discussed in Section 3.1. Figure 5-1 depicts NASA's process as it is conducted as part of the POP process.

While appearing complex, the process shown in Figure 5-1 includes some basic decision points:

1. A Program or Center determines an asset is no longer needed.
2. The asset is "marketed" to other NASA Programs through the Mission Directorates.
3. Assets with no identified NASA need are evaluated and marketed for potential out leasing or use by others. The Centers and Mission Directorates normally do this. (Refer to Section 4.4 for discussion on enhanced use leasing.)
4. Assets with no current use are evaluated as to their NASA or national strategic value by the Mission Directorates, the Shared Capability Assets Office and the Office of Program Analysis and Evaluation (PA&E) using the factors listed above. Assets with strategic value are those that have no current tenant or use, but may be needed for future NASA or national programs.
5. Unneeded assets with strategic value are maintained until needed, funded by the Center or by the Shared Capability Assets Account as determined by the Shared Capability Assets Office, PA&E, and approved by the Operations Management Council and the Strategic Management Council as applicable.
6. Unneeded assets with no strategic value are evaluated for disposal through sale or demolition.

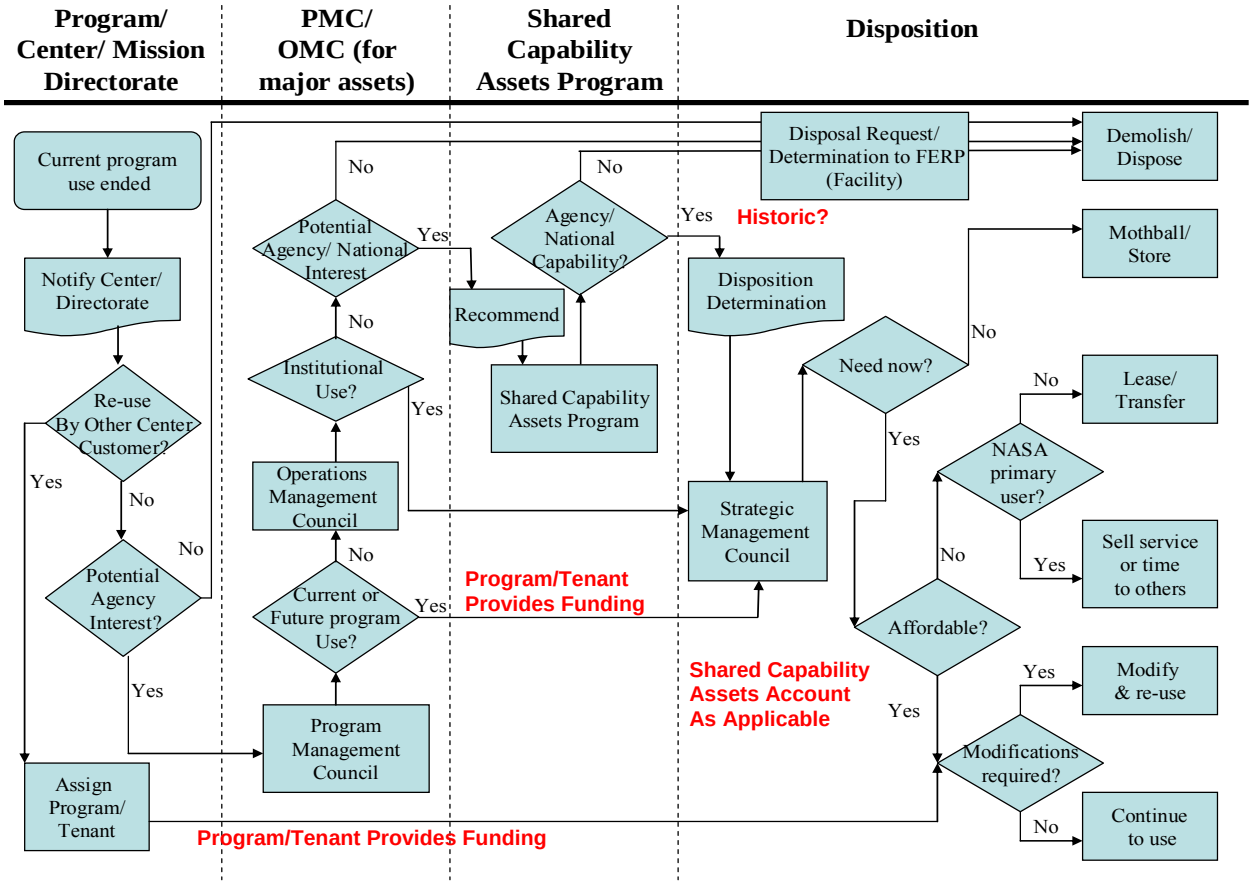


***Figure 5-1**: Asset Disposition Process*

Centers, the Program Management Council, the Shared Capability Assets Program Office, the Operations Management Council and the Strategic Management Council are all involved in the disposition process, supported by the Facilities Engineering and Real Property Division.

Once NASA decides to report property as excess to the needs of the government, NASA follows the procedures and requirements of NPR 8800.15, Real Estate Management Program Implementation Manual. This document identifies the prerequisites for disposal, exclusions, procedures, environmental and safety considerations, and applicable legal references. NASA continues to encourage re-use and disposal of real property assets to the maximum extent possible. NASA also continues to take advantage of opportunities to consolidate, vacate, and otherwise reduce the need for real property, and pursue innovative disposal actions.

5.2 Disposal Process

NASA does not have direct authority to dispose of its excess real estate assets and, therefore, must comply with the applicable provisions of the Federal Property and Administrative Services Act of 1949, as amended, 40 U.S.C. 471 et seq. This Act established the General Services Administration

as the agency responsible for the disposal of Federal assets and the sole authority to institute regulations for such actions. These regulations, Federal Property Management Regulations (FPMR) FPMR 101-47, titled, "Utilization and Disposal of Real Property," detail the procedures and forms required by a Federal agency, requesting the disposition of Federal real estate.

Specifically to NASA, prior to disposition of real property by NASA Centers, the following criteria must be met:

- Real Property must be in excess to the needs of the holding Center;
- Real Property must have been screened for possible use by other NASA Centers and determined to be not needed;
- Real Property must have been screened for historic significance, coordination with the SHPO completed, and mitigation measures completed as required;
- Real Property must have a recorded capitalized value not in excess of $50,000; and,
- Disposal action proposed must have been reviewed for legal sufficiency and concurred on by the Center's Chief Counsel Office.

Excess Real Property having a recorded capitalized value over $50,000 is submitted to Headquarters for review and approval by the Director, Facilities Engineering and Real Property Division.

In addition to the above criteria, NASA evaluates the environmental and safety impacts associated with asset disposition. Coordination with the Center Environmental Office in accordance with NPR 8800.15, Real Estate Management Program Implementation Manual, (http://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PG_8800_015A_&page_name=main) is required to ensure that all environmental requirements, particularly the closure requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA), are addressed. Environmental documentation, at a minimum, includes the following:

- *Environmental Baseline Survey* that reviews the operational history of the Real Property to identify potential environmental issues including, but not limited to, hazardous substance activities, equipment containing polychlorinated biphenyls, asbestos containing materials, underground storage tank systems, wetlands, and floodplains.
- *National Environmental Policy Act documentation* to assess potential environmental impacts of the action in accordance with NPR 8580.1, Implementing the National Environmental Policy Act and Executive Order 12114. An Environmental Assessment or Environmental Impact Statement may be required.

The Center Safety and Mission Assurance (SMA) office ensures that all safety hazards and issues have been identified and addressed to comply with NASA standards, procedures, and guidelines. Safety documentation includes a Safety Baseline Survey that provides the operational safety history of the Real Property which identifies the potential safety hazards and concerns as related,

but not limited to, constructed asset safety, fire protection, confined space entry, nuclear safety, radiation protection, explosives, and pressurized systems.

5.3 Disposal Performance Measures and Continuous Monitoring

5.3.1 Federal Real Property Council Disposal Measures

NASA will comply with any FRPC disposal measures that are published.

Disposition Algorithm: The disposition algorithm analyzes Condition Index, utilization, annual operations and maintenance costs, and Mission Dependency in order to focus attention on those assets requiring disposal, additional funding or other action (see Figure 2-6). This algorithm is currently under development by NASA, and is under discussion by the FRPC. While not a true "measure," this algorithm will help NASA focus its attention on those facilities that are eligible for disposal or out leasing.

5.3.2 Agency Specific Measures

Amount of Owned Assets: NASA tracks the amount of real property it owns and leases through number of assets, value of assets, and square footage. In general, the goal is to achieve a decreasing trend.

Demolition/Disposal Effectiveness: NASA will track the effectiveness of its demolition and disposal programs by tracking decreasing operations and maintenance costs, decreasing repair backlogs, and increasing condition index that can be directly attributable to reduction of aged, deteriorated, and unneeded assets.

Also see Appendix A for performance measures and Section 4.8.3 for other measures that can also apply to disposal. Appendix G provides a summary of recent disposals and future plans for disposal through FY2007.

5.4 Disposal Initiatives

NASA is striving to improve and expedite disposal of unneeded assets. To accomplish this, NASA has five specific initiatives underway. The initiatives include: establishment of a central demolition fund, development and implementation of the Real Property Business Plan, implementation of Enhanced Use Leasing (EUL), full cost management, and establishing a Real Estate Business Office.

Central Demolition Fund

The central demolition fund is managed by NASA Headquarters Facilities Engineering and Real Property Division for pure demolition projects; it is designed to encourage the Centers to remove excess real property. Demolition projects are submitted to FERP for review and priority evaluation. Projects with low payback periods and high rates of return earn the highest consideration for support from this fund. The fund is currently funded at $10 million per year through FY 2007.

Real Property Business Plan (RPBP)
The RPBP provides several opportunities to consolidate functions and reuse the vacated facilities; they may also be demolished, out-leased, or sold. These opportunities are the responsibility of the Centers to implement, and are centrally tracked.

Full Cost Management
Full cost management drives programmatic decisions to reduce costs, and subsequently encourage Centers to close facilities, making those facilities available for re-use, sale, or demolition.

Real Estate Business Office
NASA is establishing a small Real Estate Business Office within the Headquarters Facilities Engineering and Real Property Division. This office will be charged with assisting the Centers in implementing the Real Property Business Plan opportunities as well as developing innovative real property initiatives such as Public-Private Ventures.

Appendix A. NASA Real Property Asset Management Metrics

Metric number	Description of metric or measure	Definitions	Metric targets
Key FRPC Portfolio Metrics			
1	Condition Index (CI)	A general measure of constructed asset condition at a specific point in time. CI is calculated as the ratio of repair needs to plant replacement value (PRV). The CI will be reported as a "percent condition" on a scale of 0% to 100%, and will be calculated as (1 - $repair needs/$PRV) x 100. "Repair needs" is the amount necessary to ensure that a constructed asset is restored to a condition substantially equivalent to the originally intended and designed capacity, efficiency or capability. Agencies/Departments will initially determine repair needs based on existing processes, with a future goal to further refine and standardize the definition. PRV is the cost of replacing an existing asset at today's standards.	95%
2	Facility Utilization Index (FUI)	Percent utilization of a facility measured on a scale of 0-100%	TBD
3	Annual Facility Operating and Maintenance Costs	1. Recurring maintenance and repair costs; 2. Utilities (includes plant operation and purchase of energy); 3. Cleaning and/or janitorial costs (includes pest control, refuse collection and disposal to include recycling operations); and 4. Roads/grounds expenses (includes grounds maintenance, landscaping and snow and ice removal from roads, piers and airfields).	Downward Trend
4	Mission Dependency Index (MDI)	Three category rating (mission critical, mission dependent not critical, and non-mission dependent) that provides the assets relative importance to a mission. MDI is a systematic process for identifying the dependency of a mission on facilities in terms of interruptability, relocateability, and replaceability. MDIs are applied at the building level or asset level, and the resulting index is a driver for prioritizing projects.	Reduction of number of Non-mission Dependent Assets
5	FCI	A general measure of constructed asset condition at a specific point in time. Condition assessment surveys are performed annually cycle to quantify the repair needs of the Agency. These needs are then compared to the Current Replacement Value of the facilities that are calculated annually. Assets with a FCI of 3 or lower are considered to be in poor condition. D10	4.3
6	Percentage of program out of cycle - dollar basis	The percentage of dollars of the "out of cycle" projects from the overall real property planned budget. This is equal to the total dollars of out of cycle projects for a fiscal year divided by the total budgeted dollars of the real property budget for the fiscal year.	0 (Preliminary)
7	Percentage of program out of cycle - project basis	The percentage of projects "out of cycle" from the total number of projects within the real property planned budget. This is equal to the total number of projects "out of cycle" within a fiscal year divided by the total number of projects within the real property budget for the fiscal year.	0 (Preliminary)

Metric number	Description of metric or measure	Definitions	Metric targets
8	Size of RP program (sq ft)	Overall square footage of real property program	Downward Trend
9	Size of RP program (# of buildings)	Number of buildings within real property program	Downward Trend
10	% of Under-Utilized Assets	Number of buildings underutilized divided by the total number of buildings.	Downward Trend (Exact Goal – TBD)
11	Construction Performance – Design	KPI design = total designs completed/total designs authorized	Range .90 to 1.00
12	Construction Performance – Budget	KPI cost/budget = (final construction cost/cost at award) - 1	Less than .05
13	Construction Performance – Schedule	KPI schedule = final duration/approved duration	Less than .15
14	Construction Performance - Contract awards	KPI contract awards=total contracts awarded/total contracts approved	Range .90 to 1.00
15	Construction Performance – Obligation	KPI obligation = total $ contracts obligated/total $ available of contracts	Greater than .80
16	Construction Performance – Safety	KPI safety = Total number of LWCIR	Less than 1
17	Construction Performance – Sustainability	KPI sustainability = # LEED registered/total number of applicable projects	Greater than .50
18	Construction Performance - Customer Satisfaction Index (quality - assumed)	KPI customer satisfaction = Average normalized user satisfaction index	Greater than 4 on 5 point scale
19	Total PRV (adjusted for inflation)	Total Plant Replacement Value (PRV) - A multiple of facility quantity, CCF unit costs, area cost factors, and a factor for SIOH and design costs. Includes adjustment for inflation.	NA
20	Customer Satisfaction Index	2 tiered rating gauging a) the effectiveness of the facility meeting the mission requirement and b) needs of the individual building tenants. This may include ratings received by the Division from the annual departmental survey. Ratings: Red=declining trend, Yellow=steady state, Green=improving trend.	This is in the process of development. Target is 100% satisfaction.
21	Sustainment Rate	Ratio of actual O&M to FSM	90% by FY 2010
22	Demolition volume	Number of facilities actually demolished	Upward Trend
23	Construction - Renovation ratio	Ratio of New Construction $ to Renovation $	Downward Trend
24	New Construction to Disposal Ratio ($)	Ratio of New Construction $ to Disposal $	Downward Trend
25	% of RPBP initiatives implemented	Total number of RPB initiatives implemented/total number of initiatives suggested	Upward Trend
26	Outleasing revenue	Total $ of outleasing revenue	Upward Trend
27	Number of third party arrangements	Number of third party arrangements	Upward Trend
28	Historic facilities condition (FCI/ACI) and utilization (Utilization Index)	Re-use metrics required by Preserving America (EO 13287)	Utilization: Full

Metric number	Description of metric or measure	Definitions	Metric targets
29	Deferred Maintenance (DM)	Deferred maintenance - NASA's replacement for the standard BMAR measurement. Calculated using a parametric model based on agency wide inspection. Currently conducted on an annual basis but may change in the future. Is used to track the backlogs of NASA repair.	Downward Trend
30	Facility Revitalization Rate (FRR)	FRR=CRV/revitalization funding - expressed in years. The rate at which NASA facilities will be replaced or revitalized at current funding levels. Ratings: Red= over 67 years, Yellow = 50-67 years, Green= under 50 years.	67 Years
31	Facility Sustainment Model (FSM)	NASA uses this DoD model to determine minimum NASA wide facility maintenance requirements. The model is modified to fit NASA. NASA maintenance funding percentage of FSM requirement. Ratings: Red=below 90%; Yellow=90-95%, Green=above 95%.	NA
32	Facility Mishap Rates	Number of mishaps related to facility problems	Zero
33	Facility Maintenance Effectiveness Measures	Scheduled Maintenance $ / Total Maintenance $	Upward Trend
34	Facility Maintenance Effectiveness Measures	Breakdown Repair $ / Total Maintenance $	Downward Trend
35	Facility Maintenance Effectiveness Measures	BMAR / CRV	Downward Trend
36	Facility Maintenance Effectiveness Measures	Deferred Maintenance / CRV	Downward Trend
37	Facility Maintenance Effectiveness Measures	Maintenance & Repair $ / CRV	Upward Trend
38	Facility Security Requirements	Number of identified security requirements corrected/number of security projects identified	100%
39	Facility Safety Requirements	Number of identified safety requirements corrected/number of safety projects identified	100%
40	Facility Accessibility Requirements	Number of identified accessibility requirements corrected/number of accessibility projects identified	100%
41	Facility Age or Remaining Life	Reduce the average age of NASA facilities through demolition and repair by replacement. Measure: NASA facility age averaged Agency-wide. Ratings: Red= over 67 years; Yellow=50-67 years; Green=under 50 years. Note: Ratings assume adequate maintenance has been done. Remaining life is a better measure that is planned for development for NASA real property.	Downward Trend for Age

Appendix B. NASA Benchmarking and Best Practices

B.1 Benchmarking

NASA maintains a large inventory of sources of benchmark activities. The sources listed in this appendix demonstrate the large inventory used collectively by staff to monitor NASA performance and introduce new best practices. NASA is also very active in professional organizations (see below for a partial list of some of our partners as well as http://www.hq.nasa.gov/office/codej/codejx for more information).

- FY04 NASA-wide Facilities Condition Assessment and Deferred Maintenance Estimate, January 2005
- FY04 Facilities Condition and Deferred Maintenance Report: Significant Observations, Lessons Learned, and Suggestions for Future Improvements, October 2004
- FY04 Facilities Condition and Deferred Maintenance Report: Real Property Inventory Quality Assurance Report, October 2004
- Reliability & Safety of Aged Electrical & Dynamic Equipment, October 2004
- Deferred Maintenance Assessment of the National Naval Medical Center, September 2004
- Comparison Between FY90 Facilities Condition Survey and the FY02 Deferred Maintenance Condition Assessment, August 2004
- Reliability-Centered Building and Equipment Acceptance Guide, July 2004
- FY06 Agency-wide Facilities Sustainment Model, July 2004
- Deferred Maintenance Limits Study, June 2004
- Failure Modes and Effects Analysis and Reliability-Centered Maintenance Evaluations, 2003
- FY03 NASA-wide Facilities Condition Assessment and Deferred Maintenance Estimate, October 2003
- FY03 NASA-wide Facilities Condition Assessment and Deferred Maintenance Estimate: Real Property Inventory Anomalies Report, October 2003
- FY03 NASA-wide Facilities Condition Assessment and Deferred Maintenance Estimate: Lessons Learned Report, October 2003
- NASA Facility Sustainment Model Category Review, October 2003
- Facilities Managers Guide to Cutting Edge Management Techniques, June 2003
- Deferred Maintenance Costs versus Facility Condition Indexes, May 2003
- The NASA Deferred Maintenance Parametric Estimating Guide, April 2003
- Report on the FY02 NASA-wide Standardized Deferred Maintenance Assessment, March 2003
- General Accounting Office: Executive Guide: Leading Practices in Capital Decision-Making (GAO)/AIMD-99-32)

- The National Academies – Federal Facilities Council publications:
  - Starting Smart: Key Practices for Developing Scopes of Work for Facility Projects
  - Learning From Our Buildings: A State-of-the-Practice Summary of Post-Occupancy Evaluation (2001). FFC Technical Report #145.
  - Capital Asset Management: Tools and Strategies for Decision Making, Conference Proceedings (2001). FFC Technical Report #143.
  - Sustainable Federal Facilities: A Guide to Integrating Value Engineering, Life-Cycle Costing, and Sustainable Development (2001). FFC Technical Report #142.
  - Deferred Maintenance Reporting for Federal Facilities: Meeting the Requirements of Federal Accounting Standards Advisory Board Standard Number 6, As Amended. (2001). FFC Technical Report #141.
  - Adding Value to the Facility Acquisition Process: Best Practices for Reviewing Facility Designs (2000). FFC Technical Report #139.
  - Contracts and Agreements for the Repair and Alteration of Federal Facilities (1998) FFC Technical Report #137 (out of print)
  - Stewardship of Federal Facilities: A Proactive Strategy for Managing the Nation's Public Assets (1998). NRC Committee to Assess Techniques for Developing Maintenance and Repair Budgets.
  - Budgeting for Facilities Maintenance and Repair Activities (1996). FFC Technical Report #131.
  - The Use of Partnering in the Facilities Design Process, Summary of a Symposium (1994). FFC Technical Report #126.
- Memberships and participation in leading organizations for Real Property Management, Construction Industry, Maintenance and Engineering
  - Real Estate Executive Board
  - Construction Industry Institute
  - FIATECH
  - Federal Facilities Council Research Advisory Board
  - Society for Machinery Failure Prevention Technology
  - Society of American Military Engineers
  - National Institute of Building Sciences
  - Building Commissioning Association
  - Association for Facilities Engineering
  - Association of Physical Plant Administrators
  - US Green Building Council

- National Science and Technology Council
- Society for Maintenance and Reliability Professionals

B.2 Best Practices

- *NASA Construction of Facilities (CoF)* best practices includes procedures used to detect issues and avoid problems in the acquisition, management, and administration of design and construction contracts. Best practices, which are practical techniques gained from professional experience that may be used to improve the acquisition process and the end product, include the following:
  - Pre-project planning, to include define the project requirements and utilizing a Project Definition Requirements Index (PDRI) during three broad stages of design, with project planning being the first.
  - Site investigation and schematic design (20%), including cost estimates prior to NASA's budget submission to OMB.
  - Life cycle cost analysis concepts for selection of project systems, equipment, materials and methods. A formal economic analysis must be prepared for all major (discrete) projects costing $5M or more, as directed by OMB Circular NO. A-94.
  - Value engineering studies and review during the design phase (life-cycle cost rather than the initial cost).
  - Constructability reviews of concepts, principles, and details through all phases of constructed asset project development and design.
  - Partnering (including teaming and alignment) to promote relationships among project stakeholders.
  - Sustainability includes:

    Sustainable design

    Maintainable design (reliability centered building and equipment acceptance, or RCB&EA)

    Total building commissioning

    Safety and security

    United States Green Building Council; a leadership in energy and environmental design (LEED) silver rating is required.
  - Construction safety (ongoing), which includes developing safety metrics and best practices following the features found in three studies by the Construction Industry Institute:

    Design for Safety (Research 101)

    Safety Plus: Making Zero Accidents A Reality (Research 160)

    The Owner's Involvement in Safety (Research 190) (Preliminary release).

- *NASA Maintenance Best Practices*
  - *Reliability centered maintenance (RCM)*. The RCM philosophy employs preventive maintenance (PM), predictive testing and inspection (PT&I), repair (or reactive maintenance), and proactive maintenance techniques in an integrated manner to increase the probability that a machine or component will function in the required manner over its design life cycle. NASA has adopted a streamlined approach to the traditional, or rigorous, RCM process practiced in some industries. It adopted this approach because of the high analysis cost of the rigorous approach, the relative low impact of failure of most facilities systems, the type of systems and components maintained, and the amount of redundant systems in place. Underlying NASA's RCM approach is the concept that maintenance actions should result in real benefits in terms of improved safety, required operational capability, and reduced life-cycle cost. It recognizes that unnecessary maintenance is counterproductive and costly and can lead to an increased chance of failure.
  - *Predictive maintenance technologies, or predictive testing and inspection*. This practice calls for performing intrusive maintenance work only when necessary and to correct incipient failures before their unplanned occurrence, using airborne ultrasonics, thermography, vibration analysis, oil analysis, and various types of sophisticated electrical testing.
  - *Commercial computerized maintenance management software (CMMS)*. Used for maintenance management.
  - *Reliability centered building and equipment acceptance (RCB&EA)*. Uses modern predictive testing techniques to identify and correct latent defects in new construction and major repairs.
  - *Condition assessment system*. A system for tracking property condition.
  - *Facilities maintenance planning*. Starts at the master planning level to develop plans for maintaining facilities.
  - *Constructed asset maintenance standards*. Sets standards and actions to achieve them, including documents such as the standardized *Facilities Preventive Maintenance Work Task Guide*.
  - *Annual work plan*. Centers use templates, developed by the Computerized Maintenance Management Systems with Center input and review, to plan annual work.
- *Real property inventory system (RPI)*. An on-line feature that allows NASA to track its real property inventory.
- *Industry and government coordination*. Uses national venues—such as the National Research Council's Federal Facilities Council—to stay abreast of property management issues and innovations. NASA also coordinates with numerous other organizations including the International Facility Management Association (IFMA), National Institute of Building Sciences (NIBS), Association for Facilities Engineering (AFE), Society for Machinery Failure Prevention Technology (MFPT), Society for Maintenance & Reliability Professionals (SMRP), Society of American Military Engineers (SAME), Federal Facilities Council (FFC), Association of Higher Education Facilities Officers, Real Estate Executive

Board, National Institute of Standards and Technology (NIST), United States Green Building Council (USGBC), and Infrastructure Security Partnership (TISP).

- *Performance-based contracting (PBC) and best-value principles*. Ensure NASA gets the best performance at the lowest cost.
- *Guide performance work statement (GPWS)*. Supports developing comprehensive or reduced Center operations support services (COSS) performance-based specifications.
- *Quality assurance* (QA). Focuses on best QA practices of private industry and other federal organizations.
- *Continual analysis of internal functions and data*. Develops trends and associated improvement reports, such as:
  - NASA Deferred Maintenance Report, which describes NASA's mission directorate, center, and individual facility condition index (FCI) and deferred maintenance (DM) repair needs by major constructed asset system; facilities condition goals, using analytical methods; estimates of required capital investments to achieve various levels of facilities conditions; significant observations; lessons learned; suggestions for future improvements; and quality assurance of the NASA real property inventory system data.
  - Facility sustainment model (FSM). A parametric estimating tool, adopted from DoD to estimate zero-based annual sustainment requirements.
  - Annual functional performance metrics.
- Contract incentives (per NASA Plexus Report for best practices).
- *Training.* Facilities Engineering and Real Property Division supports and offers training to NASA employees for a number of areas including:
  - Construction of Facilities Management
  - Reliability-Centered Building and Equipment Acceptance Criteria
  - Reliability-Centered Maintenance and Predictive Testing and Inspection Technologies
  - Construction of Facilities Best Practice – Sustainable Design
  - Computer Aided Design/Geographic Information Systems
  - Real Property Management
  - ECONPAK – Life Cycle Cost Analysis Training

Appendix C. Annual Capital Improvement Plan – FY2005

FY	Center	Project Name	Repair Cost ($000)	Const Cost ($000)	Total Cost ($000)	Cumm. Cost ($000)
2005	ARC	Fire Suppression & Alarms, 229, 237	700		700	700
2005	ARC	Fire Exits and Safety Egress Mods -various buildings	800		800	1,500
2005	ARC	Legionella	1,013		1,013	2,513
2005	ARC	Legionella	1,070		1,070	3,583
2005	ARC	Upgrade Underground Communications Ductbank	1,100		1,100	4,683
2005	ARC	Fire Exits and Safety Egress Mods - Various Buildings (200, 202/202A, 211, 213, 230, 234, 236, 241)	1,300		1,300	5,983
2005	ARC	Replace Fire Suppression & Alarm System N245	1,400		1,400	7,383
2005	ARC	2nd Floor Mechanical Replacement and Elevator, N233	1,400		1,400	8,783
2005	ARC	Rehab & Mod Fire Suppression and Alarm Systems, (N200, 202/202A, 207, 216, 230, 234, 236, 238, 242)	1,400		1,400	10,183
2005	ARC	Renovation by Replacement, N266		13,000	13,000	23,183
2005	DFRC	Construct Composite Facility in B-4823		850	850	24,033
2005	DFRC	Repair Primary Electrical Distribution Systems, Phase III	1,000		1,000	25,033
2005	DFRC	Repair Paving, Phase II	1,150		1,150	26,183
2005	GRC	Rehabilitation of Electric Propulsion Laboratory (EPL) Controls, Bldg. 301, Phase 2	600		600	26,783
2005	GRC	Repair Natural Gas System, Phase 4	800		800	27,583
2005	GRC	Replace K1 & K2 Switchgear & Reinsulate Cables, Phase 2	900		900	28,483
2005	GRC	Upgrade Variable Frequency System, Engine Research Building (ERB) No. 23, Phase 2		1,100	1,100	29,583
2005	GRC	Repair High Voltage System, Plum Brook Station, Phase 1	1,200		1,200	30,783
2005	GRC	Rehabilitate Safety & Mechanical Systems, Central Air Equip Bldg No. 64, Phase 1	1,400		1,400	32,183
2005	GRC	Rehabilitation of Mechanical and Electrical Systems, Building No. 51	1,400		1,400	33,583
2005	GRC	Repair Parking Lots & Roads, Various Locations	2,000		2,000	35,583
2005	GRC	Upgrade Electronic Propulsion Research Building (EPRB) No. 16, Phase 2	3,400		3,400	38,983
2005	GSFC	Revitalization of Water System, WFF	600		600	39,583
2005	GSFC	Revitalization of Sewer System, WFF	600		600	40,183
2005	GSFC	Modify Buildings For Accessibility at Greenbelt And Wallops	800		800	40,983
2005	GSFC	Repair of High Voltage Electrical Systems, Island, Phase II of III, WFF	900		900	41,883
2005	GSFC	I/T Facilities Environmental Control Upgrades, Phase I	1,000		1,000	42,883
2005	GSFC	Upgrade Fire Alarm System, Various Buildings	1,000		1,000	43,883
2005	GSFC	Repair Site Steam Distribution System, Phase V	2,000		2,000	45,883
2005	GSFC	Building 23 Restoration Phase V	3,400		3,400	49,283
2005	JPL	Repave Table Mountain Roads	600		600	49,883
2005	JPL	Replace Roofs of Buildings 148, 149, 157, 158, 230 and 303	800		800	50,683

FY	Center	Project Name	Repair Cost ($000)	Const Cost ($000)	Total Cost ($000)	Cumm. Cost ($000)
2005	JPL	Replace Liquid Nitrogen Storage Tanks, PHASE 1	1,450		1,450	52,133
2005	JPL	Upgrade 2.4 kV Electrical Distribution System to 16.5 kV, PHASE 5	1,450		1,450	53,583
2005	JPL	Upgrade Utilities to Building 186	2,000		2,000	55,583
2005	JPL	B180 Seismic Upgrade	5,000		5,000	60,583
2005	JSC	Rehabilitation of Underground Sanitary Sewer System (JSC)	700		700	61,283
2005	JSC	Rehabilitate Sanitary Sewer System, WSTF	800		800	62,083
2005	JSC	ADA Compliance Upgrades, Phase I	1,000		1,000	63,083
2005	JSC	Replace Roof, (15)	1,200		1,200	64,283
2005	JSC	Replace Cooling Towers and Upgrade Chillers (48)	1,500		1,500	65,783
2005	JSC	Refurbish Utility Tunnel Steam and Condensate Distribution System (JSC)	1,500		1,500	67,283
2005	JSC	Replace Roofs (2)	1,500		1,500	68,783
2005	JSC	Rebuild High Voltage Arrangement, (48)	1,900		1,900	70,683
2005	JSC	Refurbish Mechanical Systems for IAQ, (4N) Phase 2	1,900		1,900	72,583
2005	JSC	Replacement of UPS, (48)	3,400		3,400	75,983
2005	JSC	Replacement and Upgrade of Electrical and Mechanical Systems (24) Phase II	4,000		4,000	79,983
2005	KSC	Install UVIR Fire Detection Systems, Various Locations		800	800	80,783
2005	KSC	Repair Roads and Pavements, Various Locations	800		800	81,583
2005	KSC	Refurbish Indian River Bridge	900		900	82,483
2005	KSC	Upgrade Water and Waste Systems, KARS Park 1	1,100		1,100	83,583
2005	KSC	Revitalize Cable and Duct Distribution, Industrial Area, Phase 2-3	1,200		1,200	84,783
2005	KSC	Upgrade Bathroom Plumbing and Fixtures, Headquarters Phase 2-3 (FROM FY-04)	1,200		1,200	85,983
2005	KSC	Rehabilitate Adjacent Seawalls, NASA Causeway	1,200		1,200	87,183
2005	KSC	Repairs to Primary Electrical Power Systems, Ph2	1,500		1,500	88,683
2005	KSC	Replace AHUs, KSC Headquarters M6-399 Phase 3-3	2,200		2,200	90,883
2005	KSC	Modify Sub-Stations for Vacuum Switch Gear, SS-900, 902 and 1001	2,300		2,300	93,183
2005	KSC	Construct Replacement Fire Station Number 2, VAB Area		4,500	4,500	97,683
2005	LaRC	Revitalization of Bldg 1268 Complex	625		625	98,308
2005	LaRC	Replace Roofs, Various Facilities	1,400		1,400	99,708
2005	LaRC	Upgrade Energy Mgmt. Control System, Various Locations	1,950		1,950	101,658
2005	LaRC	Rehabilitation of N2 and W Substations	2,000		2,000	103,658
2005	LaRC	NTF Tunnel Dryer and Cooling Coil Replacement, B 1236	2,900		2,900	106,558
2005	LaRC	Repair/Replacement of the 350 psig Steam Distribution System, Utility Tunnel # 4	9,600		9,600	116,158
2005	MSFC	Replace & Upgrade Control Systems for Bridge Cranes (Site Wide), Ph 3	1,250		1,250	117,408
2005	MSFC	Replace and Repair Roofs at Various Buildings, Phase 2	1,480		1,480	118,888
2005	MSFC	Construct Replacement Building 4601		25,800	25,800	144,688

FY	Center	Project Name	Repair Cost ($000)	Const Cost ($000)	Total Cost ($000)	Cumm. Cost ($000)
2005	SSC	Repairs to Roofs in Test Complex	600		600	145,288
2005	SSC	Replace Cryogenic & High Pressure Components in the Test Complex	700		700	145,988
2005	SSC	Replace Electrical Switchgear in the Test Complex	800		800	146,788
2005	SSC	Rehab 120/208 V Power Distribution, Site wide	900		900	147,688
2005	SSC	Restoration of Fire Alarms Systems Phase 4	1,300		1,300	148,988
2005	SSC	Restore LN2 and GHe System at HPGF	1,450		1,450	150,438
2005	SSC	Construct First Response Facility		6,000	6,000	156,438

Appendix D. Annual Capital Improvement Plan – FY2006

FY	Center	Project Name	Repair Cost ($000)	Const Cost ($000)	Total Cost ($000)	Cumm. Cost ($000)
2006	ARC	Telecom Gateway Extension, N16		890	890	890
2006	ARC	Fire Exits and Safety Egress Mods, N226, N244, N248, & N16	900		900	1,790
2006	ARC	Rehab and Mod Ames Water Supply, and Fire Suppression for N158	955		955	2,745
2006	ARC	Fire Suppression, N200, N226, N244, N256, N16	975		975	3,720
2006	ARC	Rehab & Mod 20 MW DC Power Supply, Phase IV	1,000		1,000	4,720
2006	ARC	Rehab and Mod, N226	1,000		1,000	5,720
2006	ARC	Legionella N10, N200, N207A, N212, N230, N238, N248	1,200		1,200	6,920
2006	ARC	Seismic Upgrades, N201, N223, N240	1,200		1,200	8,120
2006	ARC	Fire Suppression, N207, N247, N260, N261, N10, N510	1,250		1,250	9,370
2006	ARC	Rehab Electrical Distribution System, Phase V	5,000		5,000	14,370
2006	DFRC	Repair Hangar B-4826	1,450		1,450	15,820
2006	DFRC	Construct Freight Security Addition to B-4876		1,450	1,450	17,270
2006	DFRC	Repair Primary Electrical Distribution Systems, Phase IV	1,450		1,450	18,720
2006	DFRC	Construct Solar Heating Systems, Phase I		1,450	1,450	20,170
2006	GRC	Replace Substation A 138 kV Disconnect Switches	500		500	20,670
2006	GRC	Repair Central Process Systems, Building Nos. 5, 23, and 64	800		800	21,470
2006	GRC	Replace 2.4 kV Breakers, Building Nos. 81, 87, 90, and 94	950		950	22,420
2006	GRC	Modifications to Fuel Cell Test Facility, Building No. 334	950		950	23,370
2006	GRC	Replace Substation G Emergency Switchgear	1,000		1,000	24,370
2006	GRC	Repair High Voltage Switchgear, CAEB Building No. 64, Phase 2	1,100		1,100	25,470
2006	GRC	Rehabilitation of Engine Research Building (ERB) Altitude Exhaust System, Building No. 37	1,200		1,200	26,670
2006	GRC	Rehabilitation and Modification of Building No. 54, Phase 3	1,400		1,400	28,070
2006	GRC	Modifications for Life Safety, Fire Alarms & Sprinklers, Various Institutional Buildings	1,500		1,500	29,570
2006	GRC	Rehabilitation of Engineering Building No. 7141, Plum Brook Station, Phase 2	1,800		1,800	31,370
2006	GRC	Repair Parking Lots and Roads, Various Locations, Phase 2	2,000		2,000	33,370
2006	GRC	Repair Water System, Plum Brook Station, Phase 2	2,300		2,300	35,670
2006	GRC	Repair Sewers, Phase 6	3,100		3,100	38,770
2006	GRC	Replace Altitude Exhausters, ERB Building No. 5, Phase 1	3,300		3,300	42,070
2006	GRC	Repair Roofs & Masonry, Various Institutional Buildings	6,000		6,000	48,070
2006	GSFC	I/T Facilities Environmental Control Upgrades, Building 5, Phase II of II	800		800	48,870

FY	Center	Project Name	Repair Cost ($000)	Const Cost ($000)	Total Cost ($000)	Cumm. Cost ($000)
2006	GSFC	Modifications to Various Buildings for Accessibility, WFF	900		900	49,770
2006	GSFC	Upgrade of Island Electrical Distribution System, Phase III of III, WFF	900		900	50,670
2006	GSFC	Replace Low Voltage Electrical Systems, Various Buildings	1,000		1,000	51,670
2006	GSFC	Replacement of Fuel Oil Storage Tanks, Phase I of II, WFF	1,000		1,000	52,670
2006	GSFC	Repair of Storm Drainage System, Phase VIII of IX, WFF	1,100		1,100	53,770
2006	GSFC	Safety Upgrades to Runway 10-28, Phase II of II, WFF	1,300		1,300	55,070
2006	GSFC	Upgrade Fire Alarm Systems, Various Buildings	1,300		1,300	56,370
2006	GSFC	Modernize Magnetic Test Facility, Area 300	1,400		1,400	57,770
2006	GSFC	Repair Roofs, Various Buildings	1,400		1,400	59,170
2006	GSFC	Replacement of Septic Systems, WFF	1,400		1,400	60,570
2006	GSFC	Rehabilitate Building 88 Utilities	1,400		1,400	61,970
2006	GSFC	Modifications to HVAC Systems, Various Buildings, WFF	1,200	400	1,600	63,570
2006	GSFC	Restoration of Building 5, Phase III		2,500	2,500	66,070
2006	GSFC	Restoration of Building 23, Phase VI of VII	3,000		3,000	69,070
2006	GSFC	Site Utilities for Implementation of Master Plan	1,200	2,300	3,500	72,570
2006	GSFC	Repair Emergency Chiller System, Building 24	7,600	1,400	9,000	81,570
2006	JPL	Advanced Propulsion Laboratory Restoration, B148	750		750	82,320
2006	JPL	Upgrade Lighting, Phase II, B183	750		750	83,070
2006	JPL	Repave Roads	1,000		1,000	84,070
2006	JPL	Replace Roofs, 11 Buildings	1,200		1,200	85,270
2006	JPL	Replace Obsolete Power Control Center – Bldg 230	1,500		1,500	86,770
2006	JPL	Purchase & Improve Forestry Camp Road	1,500		1,500	88,270
2006	JPL	Replace Liquid Nitrogen Storage Tanks – PHASE 2	1,500		1,500	89,770
2006	JPL	Upgrade 2.4 kV Electrical Distribution System to 16.5 kV, PHASE 6	1,500		1,500	91,270
2006	JPL	Upgrade HVAC Systems in Buildings 168 and 169	1,500		1,500	92,770
2006	JPL	Expansion and Restoration of B200 for Offices	1,500		1,500	94,270
2006	JPL	B303 Cafeteria Remodel	1,600		1,600	95,870
2006	JPL	Spacecraft Assembly Facility Repair, B179, Ph 1	3,500		3,500	99,370
2006	JPL	Building 238 Seismic Upgrade	6,000		6,000	105,370
2006	JSC	Install Utility Metering Phase I		1,000	1,000	106,370
2006	JSC	Rehab Mission Simulation Development Facility (35)	1,300		1,300	107,670
2006	JSC	Replace Roofs, Various Buildings (16, 7)	1,500		1,500	109,170
2006	JSC	Central Plant Equipment Rehabilitation and Plant Upgrades (24)	1,500		1,500	110,670
2006	JSC	Repair Sanitary Sewer System, Ellington Field	1,500		1,500	112,170
2006	JSC	Repair Sprinkler and Fire Alarm Systems, Phase I	1,500		1,500	113,670
2006	JSC	Rehab Exchange Facilities, Phase II (3, 11, 207)		1,500	1,500	115,170
2006	JSC	Replace Loggia Ledge Coatings, Various Buildings	1,500		1,500	116,670
2006	JSC	Replace Roofs, Various Buildings (3, 13)	1,500		1,500	118,170
2006	JSC	Upgrade Domestic Water Systems, Various Buildings	1,500		1,500	119,670

FY	Center	Project Name	Repair Cost ($000)	Const Cost ($000)	Total Cost ($000)	Cumm. Cost ($000)
2006	JSC	Repair Sprinkler and Fire Alarm Systems, Phase 2	1,500		1,500	121,170
2006	JSC	Upgrade/Rehab Electrical Substation and Dist. System, Sonny Carter Training Facility	1,700		1,700	122,870
2006	JSC	Refurbish Public Affairs Facility (2North)	3,300		3,300	126,170
2006	JSC/ WSTF	WSTF Clean room Facilities Upgrades	500		500	126,670
2006	JSC/ WSTF	Repair Site Roofs, Phase 2, WSTF	1,400		1,400	128,070
2006	KSC	Install Grounding System & Upgrade Low Voltage Distribution System, CIF M6-342	500		500	128,570
2006	KSC	Construct Marine Patrol Support Facility		600	600	129,170
2006	KSC	Construct Waste Management Support Facility		600	600	129,770
2006	KSC	Upgrade Emergency Lighting System and Parking Lot Lighting, HQ	700		700	130,470
2006	KSC	Upgrade Facilities for Disabled Access, Various Locations	800		800	131,270
2006	KSC	Install Optical Fire Detection Systems, Various Locations		800	800	132,070
2006	KSC	Construct Replacement Facility, Beach Corrosion Test Site		800	800	132,870
2006	KSC	Replace EDL Roof, M7-0409	800		800	133,670
2006	KSC	Upgrade Primary Power System, M6-0409	900		900	134,570
2006	KSC	Industrial Area Chiller Plant (IACP) Upgrades, KSC	900		900	135,470
2006	KSC	Repair/Overlay Perimeter Roads and Parking Lots, K6-848	1,000		1,000	136,470
2006	KSC	Install Generators, CIF		1,000	1,000	137,470
2006	KSC	Restore and Upgrade HVAC System, EDL	1,000		1,000	138,470
2006	KSC	Refurbish Jay Jay Railroad Bridge	1,100		1,100	139,570
2006	KSC	Replace Critical Transformers, Industrial & LC-39 Areas, Phase 2	1,100		1,100	140,670
2006	KSC	Revitalize and Upgrade KSC Water & Waste Water Systems, Various Locations	1,200		1,200	141,870
2006	KSC	Revitalize Cable and Duct Distribution, Industrial Area, Phase 3-3	1,200		1,200	143,070
2006	KSC	Upgrade Bathroom Plumbing and Fixtures, HQ BLDG M6-399, Phase 3-3	1,200		1,200	144,270
2006	KSC	Refurbish Banana River Bridge	1,300		1,300	145,570
2006	KSC	Replace High Voltage Substations at M7-505	1,400		1,400	146,970
2006	KSC	Construct Replacement Training Facility, Phase 2		2,000	2,000	148,970
2006	KSC	Construct Advanced Technology Development Center, High Pressure Gas Pipelines		2,000	2,000	150,970
2006	KSC	Construct Jet Fuel Storage Tank Facility, SLF		2,500	2,500	153,470
2006	KSC	Construct Replacement Protective Systems Engineering & Shop Office Bldg., (KSC)		2,600	2,600	156,070
2006	KSC	Renovation of O&C (M7-0355) North Wing, East Half - 1st floor, Phase 2	3,400		3,400	159,470
2006	KSC	Replace Life Support Facility	3,600		3,600	163,070
2006	KSC	Construct Advanced Technology Development Center, Cryogenic Storage Spheres		5,000	5,000	168,070

FY	Center	Project Name	Repair Cost ($000)	Const Cost ($000)	Total Cost ($000)	Cumm. Cost ($000)
2006	LaRC	Increased Research Air Flow Capability, Anechoic Noise Research Facility, B1218A	630		630	168,700
2006	LaRC	Refurbishment of B645A	1,000		1,000	169,700
2006	LaRC	Rehab of Elevators, Various Facilities	1,170		1,170	170,870
2006	LaRC	ADA Upgrades, Various Facilities, Phase II	1,500		1,500	172,370
2006	LaRC	Repair Roads and Parking Lots, Various Facilities	1,800		1,800	174,170
2006	LaRC	Rehab of Building 1192, D, & E	2,400		2,400	176,570
2006	LaRC	Enhanced High Pressure Air Capability for NTF, B1236	2,450		2,450	179,020
2006	LaRC	Rehab of Bldg 1299	3,260		3,260	182,280
2006	LaRC	Repair Steam Condensate Return System in Tunnels	3,400		3,400	185,680
2006	LaRC	Upgrade LaRC Electrical Power Distribution System, Phase 1	6,700		6,700	192,380
2006	LaRC	Upgrade to 16 Meter Vacuum Chamber, B1293B	6,740		6,740	199,120
2006	LaRC	Construct LN2 Production and Distribution System		18,000	18,000	217,120
2006	MSFC	Construct Additional Bays, Phase 1		1,200	1,200	218,320
2006	MSFC	Replace & Upgrade Control Systems for Bridge Cranes (Site Wide), Ph 4	1,400		1,400	219,720
2006	MSFC	Replace HVAC and Electrical Equipment (4570)	1,900		1,900	221,620
2006	MSFC	Replace Asbestos Siding and Provide Energy/Safety Upgrades to Bldg Systems (4705), Phase 1	3,000		3,000	224,620
2006	MSFC	Energy Upgrades to Central Chiller Plant (4473)	3,600		3,600	228,220
2006	MSFC	Construct Replacement Building 4602		29,000	29,000	257,220
2006	SSC	Repairs to Roofing (1103, 1105, 2201, 8110)	600		600	257,820
2006	SSC	Repairs to Administration Area Heating System	600		600	258,420
2006	SSC	Replace Cryogenic & High Pressure Components in the Test Complex	700		700	259,120
2006	SSC	Repairs to Emergency Lighting Phase 1	800		800	259,920
2006	SSC	Repairs to 13.8kV unit Substations in the Test Complex	800		800	260,720
2006	SSC	Repair 120/208V Power Distribution, Site wide Phase 2	900		900	261,620
2006	SSC	Repairs to B-Complex Heating System	1,100		1,100	262,720
2006	SSC	Restoration of Fire Alarm Systems Phase 5	1,300		1,300	264,020
2006	SSC	Repairs to Cafeteria Building 1100	1,400		1,400	265,420
2006	SSC	Relocation of SSC Visitors Center		4,000	4,000	269,420

Appendix E. Annual Capital Improvement Plan – FY2007

FY	Center	Project Name	Repair Cost ($000)	Const Cost ($000)	Total Cost ($000)	Cumm. Cost ($000)
2007	ARC	Rehab & Mod HVAC System, N245	700		700	700
2007	ARC	Repair Storm Drains	800		800	1,500
2007	ARC	Improve Ventilation Systems, N237, N240, & N242	900		900	2,400
2007	ARC	Rehab & Mod Utility Controls Panels/Bench Boards, N238	1,000		1,000	3,400
2007	ARC	Repair Roof & HVAC System, N003	1,000		1,000	4,400
2007	ARC	Runway 32L Repavement	1,100		1,100	5,500
2007	ARC	Seismic Upgrades, N244 & N245	1,250		1,250	6,750
2007	ARC	Emergency Generator, N233		1,300	1,300	8,050
2007	ARC	Interaction Heating Facility Heat Exchanger, N238		3,400	3,400	11,450
2007	ARC	Rehab electrical Distribution System, Phase VI	3,000	450	3,450	14,900
2007	DFRC	Repair Roofs, Phase II	500		500	15,400
2007	DFRC	Repair Primary Electrical Distribution System, Phase V	800		800	16,200
2007	DFRC	Repair B-4800 Infrastructure, Phase IV	800		800	17,000
2007	DFRC	Repair DFRC UPS	1,000		1,000	18,000
2007	GRC	Rehab of High Voltage Substations B & G	500		500	18,500
2007	GRC	Repair Utility Tunnel, Building Nos. 23 & 77	600		600	19,100
2007	GRC	Mods. For Life Safety, Fire Alarms & Sprinklers, Various	1,000		1,000	20,100
2007	GRC	Repair Roofs & Masonry, Various Institutional Buildings	1,300		1,300	21,400
2007	GRC	Repair Sewers, Phase 8	1,400		1,400	22,800
2007	GRC	Rehab Mech & Elect Systems, Building No. 21 Annex	1,400		1,400	24,200
2007	GRC	Rehab Mech & Elect Systems, Building No. 60, Phase 2	1,500		1,500	25,700
2007	GRC	Repair Parking Lots & roads, Various Locations, Phase 2	2,000		2,000	27,700
2007	GRC	Rehab Electrical Substation M1, West Area	2,400		2,400	30,100
2007	GRC	Rehab MFIF Building No. 14, Phase 4	3,800		3,800	33,900
2007	GSFC	Repair Roofs, Various Buildings, Greenbelt		600	600	34,500
2007	GSFC	Addition to Launch Project Building, WFF	1,500		1,500	36,000
2007	GSFC	Replacement of W.O.T.S., 1.1 MW Generator, WFF	200	1,900	2,100	38,100
2007	GSFC	Restoration of Building 23, Phase VI of VII, Greenbelt		2,700	2,700	40,800
2007	GSFC	Repair Emergency Chiller System, Building 24, Phase II, Greenbelt	3,200		3,200	44,000
2007	GSFC	Facilities Master Plan Roadway Upgrades, Phase I of II, Greenbelt	3,700		3,700	47,700
2007	JPL	Perimeter security fencing		750	750	48,450
2007	JPL	Install Fire Suppression Systems, Various Buildings, Table Mountain Facility	750		750	49,200
2007	JPL	Replace Roofs B117,122,126,201,231,233,243,245,253,302	1,000		1,000	50,200
2007	JPL	Accessibility Modifications, Various Buildings, Phase 1	1,000		1,000	51,200
2007	JPL	Replace HVAC System, Space Flight Operations Facility (SFOF), B230	2,500		2,500	53,700

FY	Center	Project Name	Repair Cost ($000)	Const Cost ($000)	Total Cost ($000)	Cumm. Cost ($000)
2007	JPL	Upgrade/Modify 25-ft Space Simulator to Reduce Operating Costs, B150	4,600		4,600	58,300
2007	JPL	Spacecraft Assembly Facility Repair, B179, Phase 2	4,900		4,900	63,200
2007	JPL	Flight Projects Center, PHASE 2		20,000	20,000	83,200
2007	JPL	Administration Building & Education Center, PHASE 2		26,500	26,500	109,700
2007	JPL Offsite	Replacement of HVAC Equipment & MCC at G-86, Goldstone, CA	870		870	110,570
2007	JPL Offsite	Upgrade Electrical Distribution, Madrid, Spain	1,062		1,062	111,632
2007	JPL Offsite	Upgrade Electrical Distribution, Canberra, Australia	1,166		1,166	112,798
2007	JPL Offsite	Replace Uninterruptible Power Systems at G-86, Goldstone, CA	1,468		1,468	114,266
2007	JPL Offsite	Revitalization of Water Transmission & Distribution System, Goldstone, CA	4,957		4,957	119,223
2007	JSC	Construct Suit Processing Lab		3,000	3,000	122,223
2007	JSC	Replace Roofs, Various Buildings	4,000		4,000	126,223
2007	JSC	Water System Upgrades, WSTF	4,000		4,000	130,223
2007	JSC	Construct New Office Facility		15,000	15,000	145,223
2007	JSC	Construct Bioastronautics Facility		87,300	87,300	232,523
2007	KSC	Replace Critical Transformers, Industrial & LC-39 Areas, Phase 2 of 5	500		500	233,023
2007	KSC	Upgrade Facilities for Disabled Access, Various Locations		700	700	233,723
2007	KSC	Construct Replacement Battery & Generator Storage Facility	700		700	234,423
2007	KSC	Upgrade Industrial Area Chiller Plant (IACP)		975	975	235,398
2007	KSC	Revitalize and Upgrade KSC Water & Waste Water Systems, Various Locations	1,200		1,200	236,598
2007	KSC	Refurbish Banana River Bridge	1,300		1,300	237,898
2007	KSC	Revitalize Cable and Duct Distribution, Industrial Area, Phase 4 of 6	2,300		2,300	240,198
2007	KSC	Repairs to C-5 Substation	2,450		2,450	242,648
2007	KSC	Replace AHUs, KSC Headquarters M6-399 Phase 3 of 3	3,675		3,675	246,323
2007	KSC	Renovation of O&C (M7-0355) North Wing, West Half - 3rd floor, Ph. 2 of 6 (Total 6-Yr = $36.7M)	7,200		7,200	253,523
2007	LaRC	Refurbishment of B645A	500		500	254,023
2007	LaRC	ADA Upgrades, Phase III	1,800		1,800	255,823
2007	LaRC	Upgrade Stratton Road Substation, B1233	1,900		1,900	257,723
2007	LaRC	Electrical Upgrade, Blg 1266	2,570		2,570	260,293
2007	LaRC	Repairs to High Pressure Air Distribution System	3,380		3,380	263,673
2007	LaRC	Replace Electrical Systems, Various Facilities	3,790		3,790	267,463
2007	MSFC	Safety and Energy Upgrades to Building Systems (Various Bldgs) Phase 1	3,000		3,000	270,463
2007	MSFC	4207 Rehab Building Systems	6,900		6,900	277,363
2007	MSFC	Construct Replacement Building 4601 (Deferred from FY05 &FY06) Phase 1		13,000	13,000	290,363

FY	Center	Project Name	Repair Cost ($000)	Const Cost ($000)	Total Cost ($000)	Cumm. Cost ($000)
2007	MSFC/ ARF	Refurbish Horizontal Doors Hangar AF	1,000		1,000	291,363
2007	MSFC/ ARF	Repair Hydrolaser Process Effluent System, Hangar AF	1,850		1,850	293,213
2007	MSFC/ MAF	Replace Breathing/Plant Air Compressors	1,000		1,000	294,213
2007	MSFC/ MAF	Rehab Production Wastewater Process Tanks Ph-1	1,200		1,200	295,413
2007	MSFC/ MAF	Replace Roof, Bldg 420	1,200		1,200	296,613
2007	MSFC/ MAF	Replace Plant Air System, Bldg 103	1,400		1,400	298,013
2007	MSFC/ MAF	Replace Substation 46 & MCCs (131)	1,700		1,700	299,713
2007	MSFC/ MAF	Rehab Cranes & Trolleys/Controls ph-1	2,000		2,000	301,713
2007	MSFC/ MAF	Replace Fire Alarm Systems Ph -3	2,400		2,400	304,113
2007	MSFC/ MAF	Replace Feeders 17 & 31	2,700		2,700	306,813
2007	SSC	Repair Pavement Various Locations	700		700	307,513
2007	SSC	Restoration of Fire Alarm Systems Phase 6	700		700	308,213
2007	SSC	Repairs to Power Distribution Site wide Phase 2	800		800	309,013

Appendix F. Initiatives and Measures/Goals

INITIATIVES LOOKING THREE YEARS OUT

NASA is striving to improve the delivery of on time, within budget, and within scope capital projects. To accomplish this, NASA has two goals, specified in the Real Property Management Plan, to improve planning and delivery of acquisition projects and to improve financial and program management. NASA also has goals associated with evaluating its real property and disposing of that which is unneeded, leveraging underutilized real property and sustaining, revitalizing and modernizing its real property.

The acquisition initiatives specifically address (1) identification and addressing of real property requirements as an integral part of Agency, mission directorate, program, and project planning; and, (2) construction and operation of new real property to meet mission requirements only when existing capabilities cannot be effectively used or modified. Additionally, NASA initiatives associated with operations and disposal address (3) continually evaluating real property assets to ensure alignment with the NASA mission; (4) leveraging real property to its maximum potential; and (5) sustaining, revitalizing, and modernizing real property required by the NASA mission.

REAL PROPERTY ACQUISITION

Real Property Requirements as Integral Part of Planning

To ensure that NASA appropriately plans for future mission needs it is necessary that Real Property Requirements be developed as early in the planning phase as possible. To effect this change, NASA has modified or is in the process of modifying its policy and procedural requirements.

1. Modify NPR 7120, NASA Program and Project Management Processes and Requirements to include a business case for the construction of all new real property
   Milestones:
   - Q2 of FY05, Include Business Case requirement into NASA policy document NPR 7120. ***(complete)***
   - Q1 of FY06, Define specific criteria for Business Case development.
   - Q2 of FY06, Begin Business Case reviews.

Construct and Operate New Real Property Only When Absolutely Necessary

NASA will examine all new real property requirements to ensure that only capabilities that are not available elsewhere at equivalent or lower cost are built and operated. Determinations will also be made considering advanced technologies as alternatives to brick and mortar constructed asset solutions, modifying existing NASA real property, and leveraging the resources (fiscal and physical) of other federal agencies, industry, and academia.

2. Modify NPR 8810, Master Planning Procedural Requirements, to outline procedural requirements for Center master planning for real property, instructions for accomplishing the master planning process, and specifies content of the Center Master Plan.

Milestones:

- Q3 of FY05, Guidance and requirements document for Center Master Plans issued. ***(complete***)
- Q3 of FY06, Update status of MPs for Centers thru POP process.

3. Complete Capital Improvement Plans.
   Milestones:
   - Q4 of FY05, Complete first Capital Improvements Plan (Capital Improvements Plan Attached as example of Specific Action) ***(complete)***
   - Q4 of FY 06, Annual Update of Capital Improvements Plan
   - Q4 of FY 07, Annual Update of Capital Improvements Plan

4. Collect Full Cost Information during Program Operating Plan (POP) cycle.
   Milestones:
   - Q3 of FY05, Complete Full Cost Information for CoF Program. ***(complete)***

REAL PROPERTY ASSET EVALUATION - ENSURE ALIGNMENT WITH NASA MISSION; DISPOSAL OF UNNEEDED ASSETS

Continually Evaluate Real Property Assets To Ensure Alignment With The NASA Mission
NASA identifies and addresses real property requirements as an integral part of Agency strategic planning. Initiatives include conducting and periodically updating a corporate analysis that correlates mission requirements with real property infrastructure, identifying capability gaps and determining how to fulfill the capability, identifying and eliminating redundant and excess capabilities, demolishing unneeded facilities, and developing and maintaining Center Master Plans.

5. Update Real Property Asset Management Plan as necessary.
   Milestones:
   - Q1 of FY06, Update RP AMP to include new organization and metrics, rolling plan updates.
   - Quarterly, Review RP AMP to ensure relevancy and utilization of plan throughout NASA.

6. Complete Mission architecture studies to determine infrastructure needs.
   Milestones:
   - Q4 of FY05, Exploration of Space Architecture Study and Station/Shuttle Configuration Options Team report out. (complete)
   - Q1 of FY06, Systems Engineering and Institutions Transitions Team report out, including facilities recommendations.
   - Annual POP Process, Review facilities requirements and future plans (capital improvement plans, demolition and facility status change plans).
7. Develop and implement the Real Property Business Plan.
   Milestones:
   - Q1 of FY05, Issue RPBP to Centers for implementation. ***(complete)***

- Q1 of FY06, Track implementation at Centers by call for update.
- Q1 of FY07, Track implementation at Centers by call for update.

8. Implement Mission Dependency Index (MDI).
   Milestones:
   - Q2 of FY05, Initiate MDI preparation. ***(complete)***
   - Q4 of FY05, Complete MDI at 3 NASA sites. ***(complete)***
   - Q1 of FY06, Complete MDI at 3 additional NASA sites.
   - Q2 of FY06, Complete MDI at 3 additional NASA sites.
   - Q3 of FY06, Complete MDI at 2 additional NASA sites.

9. Develop Disposition Algorithm to analyze condition index, utilization, annual operations and maintenance costs, and mission dependence in order to focus attention on those assets requiring additional funding, disposal, or other actions.
   Milestones:
   - Q3 of FY05, Develop initial draft Disposition Algorithm (DA) for testing. ***(complete)***
   - Q4 of FY05, Load data into DA for testing with Center data. ***(complete)***
   - Q2 of FY06, Test DA with center data from FRPP report update.
   - Q3 of FY 06, Provide DA data to Centers for use in developing FY08 budget requirements.

10. Dispose of unneeded assets.
    Milestones:
    - Establish Central Demolition Fund.
      - Q1 of FY 04, Establish Central Demolition Fund ($10M per year for FY 04 through FY 07. ***(complete)***
      - Q4 of FY 04, Track Demolition Execution ***(complete)***
      - Q4 of FY 05, Track Demolition Execution (Demolition Execution Report Attached as Example of Specific Action) ***(complete)***
      - Q3 of FY06, Determine additional demolition requirements for FY08 budget preparation.
      - Q4 of FY 06, Track Demolition Execution
      - Q4 of FY 07, Track Demolition Execution
    - Q1 of FY06, Establish Shared Capability Asset Program to ensure financial viability of strategic assets.
    - Establish plans for inactivating underutilized constructed assets.
      - 3Q of FY 05, Centers report planned change of status ("active" to "inactive" of existing facilities (Report Attached). ***(complete)***
      - 3Q of FY 06, Update planned change of status through budget preparation process.

11. Update Center Master Plans.
    Milestones:
    - Q3 of FY05, Issue guidance and requirements document for Center Master Plans (NPR 8810). ***(complete)***
    - Q2 of FY06, Issue call to Centers for required 3-year review of Center MPs, set plans for MP completion at each Center. ***(complete)***
    - Quarterly, Track implementation at Centers.

Leverage Real Property To Its Maximum Potential

NASA would like to move forward with initiatives to seek alternatives to NASA ownership of real property where feasible and economically viable. This includes outleasing and consolidating functions associated with underutilized property, and making full use of authorities that allow public/private agreements and cost sharing, such as enhanced-use leasing authority and Space Act agreements. NASA would also like to pursue such initiatives such as third-party financing/services-in-kind opportunities including privatization.

12. Establish a Real Property Business Office.
    Milestones:
    - Q1 of FY05, Issue RPBP to Centers for implementation. ***(complete)***
    - Q2 of FY05, Added staff to Real Estate Team to assist in business plan development. ***(complete)***
    - Q2 of FY06, Review potential for additional staff.

13. Expand the enhanced-use leasing authority to include all NASA Centers.
    Milestones:
    - Q3 of FY05, Submit appropriations language for budget that expands authority to all Centers. ***(complete…language has not been approved by Congress)***
    - Q3 of FY06, Submit appropriations language for budget that expands authority to all Centers.

14. Award Real Estate Services Contract.
    Milestones:
    - Q2 of FY05, Issue SOW and documents for solicitation. ***(complete)***
    - Q1 of FY06, Award contract. ***(complete)***
    - Q1 of FY06, Open task order contract to Centers for their use.
    - Q4 of FY06, Review use of real estate service contract to ensure best use by Centers.

REAL PROPERTY OPERATIONS

Sustain, Revitalize, And Modernize Real Property As Required By The NASA Mission NASA is in the early stages of collecting operations and maintenance costs. As NASA collects and benchmarks O&M over the next few years, improvement initiatives will be developed as necessary and operating efficiency will be tracked. NASA has the following initiatives in place now: Sustainability, Energy Conservation, Reliability Centered Maintenance and Performance Based Contracting.

15. Promote sustainability.
    Milestones:
    - 4Q FY 03, Establish Sustainability Policy. ***(complete)***
    - 4Q of FY 03, Conduct NASA Pilot Sustainability Course ***(complete)***
    - 2 & 4Q of FY 04, Conduct NASA Sustainability Course ***(complete)***
    - 4Q of FY 05, Conduct NASA Sustainability Course ***(complete)***
    - 4Q of FY 06, Conduct NASA Sustainability Course
    - 4Q of FY 06, Track success of sustainability policy, modify as necessary.

16. Promote Reliability Centered Maintenance.
    Milestones:
    - Q4 of FY03, Develop basic RCM and PT&I training. ***(complete)***
    - FY 04-FY 05, Conduct RCM training throughout NASA. ***(complete)***
    - 3Q of FY 06, Conduct advanced RCM and PT&I Seminars.
    - 3Q of FY 06, Test of live, interactive web-based training.
    - 4Q FY 06 (annually), Monitor application of RCM/PT&I techniques.

17. Complete the upgrades to the RPI.
    Milestones:
    - Q1 of FY05, Develop requirements for first round of upgrades. ***(complete)***
    - Q2 of FY05, Centers submit new data requirements with POP data (leadership) data call. ***(complete)***
    - Q2 of FY05, Develop requirements for second upgrades to support metrics, and FRPP reporting. ***(complete)***
    - Q4 of FY05, Issues second round of changes to Centers for classification changes. ***(complete)***
    - Q2 of FY06, Check submission for FRPP and determine if additional upgrades are necessary.

18. Establish the Maintenance Best Practices Team.
    Milestones:
    - Q3 of FY 05, Form Operations and Maintenance of Facilities Innovation Team. ***(complete)***
    - Q4 of FY 06, Team operations.

- Q4 of FY 07, Extension of Whole Building Design Guide to incorporate Operations and Maintenance Best Practices

19. Complete assessment of Facility Utilization data.
    Milestones:
    - Q4 of FY05, Complete spot check of utilization and criticality submissions by Centers. ***(complete)***
    - Q4 of FY06, Develop new utilization metrics/definitions.
    - Q3 of FY 07, Collect and populate utilization of assets data into the RPI.

20. Complete population of data within the RPI upgrades.
    Milestones:
    - Q4 of FY05, Issue second round of changes to Centers for classification changes. ***(complete)***
    - Q1 of FY06, Centers submit data for FRPP report and population complete.
    - Q2 of FY06, Check submission for FRPP and determine if additional upgrades are necessary.

21. Improve the average condition of Agency facilities.
    Milestones: Current Condition of NASA facilities: 3.7
    - Q4 of FY07, Goal: stay at 3.7
    - Q4 of FY08, Goal: 3.8
    - Q4 of FY09, Goal: 3.9
    - Q4 of FY10, Goal: 4.0
    - Note: Achievement of this goal is dependent upon obtaining adequate funds to sustain and improve NASA facilities.

22. Establish a measurement of Plant Replacement Value (PRV).
    Milestones:
    - Q3 of FY05, Issue review contract for RPI data including classification of capital costs. ***(complete)***
    - Q2 of FY06, Centers and CFO review recommendations for change and approve changes.
    - Q3 of FY06, Make changes to RPI and re-align PRV for facilities.

The prioritized improvement goals, related actions and milestones associated with these initiatives will be detailed in Appendix F of the next publication of NASA's Real Property Asset Management Plan. The above initiatives and the draft Capital Improvement Program Plan (including Demolition Execution Report and Facility Status Changes Plan) constitute NASA's 3-year plan to strive to meet its real property goals, targets, and milestones.

Appendix G. Recent and Future Disposals

FY	Center	Project Name	Demolition Cost ($000)	Other Funds ($000)	Total Cost ($000)
2004	LaRC	Demolish Buildings, Various Locations	957	0	957
2004	MSFC	Demolish Millimeter Wavelength Fac (4372)	60	0	60
2004	MSFC	Demolish HYD Transfer Control (4518)	2	0	2
2004	MSFC	Demolish LOX Transfer House (4519)	2	0	2
2004	MSFC	Demolish LOX Storage Facility (4516)	69	0	69
2004	MSFC	Demolish LH2 Storage Facility (4517)	221	0	221
2004	MSFC	Demolish Observation Bunker (4697)	47	0	47
2004	MSFC	Demolish Shop Building (4495)	47	0	47
2004	GRC	Demolition of Tayor Road Sewage Plant, Plum Brook Station	500	0	500
2004	GRC	Demolish E-Site Test Building No. 2411, Plum Brook Station	750	0	750
2004	GRC	Demolition of Propulsion Systems Lab (PSL) Combustion Air Heaters, Bldg 76	850	0	850
2004	GRC	*Demolish Water Towers, Plum Brook Station	861	0	861
2004	JSC	Demolish Cooling Tower Pre-Treatment Plant and Sludge Drying Beds (223)		500	500
2004	JSC	Demolish Below Ground Photographic Waste Storage Facility and Control Room (8a)		100	100
2004	DFRC	Demolition of Post Flight Research Facility, B4984	250	0	250
2004	GSFC/WFF	ADAS Facility	550	0	550
2004	GSFC/WFF	Old CG Station	250	0	250
2004		FP&D	2,000	0	2,000
2004	SSC	Building 3203 Derrick Crane - abandoned equipment (lead paint)	100	0	100
2004	JSC	Demolish Child Care Facility (210/ 210a)	110	0	110
2004	JSC	Demolish Support Office Building 265 South Side	105	0	105
2004	JSC	Demolish Building 353 Steam System PART 1	400	0	400
2004	JSC	Demolish Logistic Support Building (38)	100	0	100
2004	JSC	Demolish Fire Training Center (384)	50	0	50
2004	JSC	Demolish Emergency Retention Pit (356)	50	0	50
2004	JSC	Demolish Blast Walls (354)	50	0	50
2004	JSC	Demolish Miscellaneous Roads and Concrete Structures	0	0	0

FY	Center	Project Name	Demolition Cost ($000)	Other Funds ($000)	Total Cost ($000)
2004	KSC	TR1-634 Trailer	4	0	4
2004	KSC	TR1-739 Coastal building sys/trailer	4	0	4
2004	KSC	TR1-742 Coastal building sys/trailer	4	0	4
2004	KSC	TRM-049 Temp building #70, Hangar L	15	0	15
2004	KSC	TR1-617 Coastal building sys	4	0	4
2004	KSC	TR1-620 Coastal building sys	4	0	4
2004	KSC	TR1-625 Coastal building sys	4	0	4
2004	KSC	K7-516 Propellant lab & HP gas facility	625	0	625
2004	KSC	J5-1598 Air traffic control tower	14	0	14
2004	KSC	M7-1460 Liquid hydrogen pad	10	0	10
2004	KSC	M7-1461 Liquid hydrogen pad	10	0	10
2004	KSC	M7-1411 Hazardous waste staging shelter	2	0	2
2004	KSC	K7-515 De-ionized water plant	5	0	5
2004	KSC	K7-562 Cleaned component & equip storage	18	0	18
2004	KSC	K&-563 Propellant Transporter R&M shed	67	0	67
2004	KSC	K7-564 Breathing air storage battery	1	0	1
2004	KSC	K7-565 Reclamation plant	1	0	1
2004	KSC	K7-612 POL shed	3	0	3
2004	KSC	K7-613 K-bottle storage	7	0	7
2004	KSC	K7-614 K-bottle storage	13	0	13
2004	KSC	K7-513 Waste water treatment plant	28	0	28
2004	KSC	M6-240 Gate 2B Industrial area gate shack	6	0	6
2004	KSC	M7-453 Concrete pillars/north parking lot	9	0	9
2004	KSC	M7-1410 Hypergol module storage, west	171	0	171
2004	KSC	M7-1410A Equipment shelter	19	0	19
2004	KSC	M7-1412 Hypergol module storage, east	171	0	171
2004	KSC	M7-1412A Equipment shelter	19	0	19
2004	GSFC/WFF	F-027 Paper Shredder Facility	5	0	5
2004	GSFC/WFF	F-030 Pump House	3	0	3
2004	GSFC/WFF	F-211 Storage Building	3	0	3
2004	GSFC/WFF	H-023 Water Pump House	2	0	2
2004	GSFC/WFF	H-114 Water Pump House	2	0	2

FY	Center	Project Name	Demolition Cost ($000)	Other Funds ($000)	Total Cost ($000)
2004	GSFC/WFF	M-003 Bunkers	15	0	15
2004	GSFC/WFF	M-004 Bunkers	15	0	15
2004	GSFC/WFF	M-005 Bunkers	6	0	6
2004	GSFC/WFF	M-006 Bunkers	3	0	3
2004	GSFC/WFF	Y-036 Firing Cubicle	2	0	2
2004	GSFC/WFF	Y-037A Launch Complex Fire Cub #2	2	0	2
2004	MSFC	Paint Shop (4480)	0	0	0
2004	MSFC	Propulsion System Test Stand (4514)	0	0	0
2004	MSFC	Transient Pressure Test Facility (4515)	0	0	0
2004	MSFC	Fuel Storage Facility	0	0	0
2004	JSC	Demolish Building 353 Steam System Part 2	325	0	325
FY04 Total					10,600
2005	GRC	Demolition of Power House No. 1, Building No. 8531, Plum Brook Station	1,000	0	1,000
2005	GRC	Demolish Industrial Waste Basins, Structure No. 103	500	0	500
2005	JSC	Demolish Thrust blocks (353) 1	0	0	0
2005	ARC	N218 14 FT. Wind Tunnel (Tunnel Section)	2,000	0	2,000
2005	ARC	N218 14 FT. Wind Tunnel (Air Exchange Bldg.)	1,000	0	1,000
2005	MSFC	Demolish Center Activities Building (4642)	0	0	0
2005	MSFC	Demolish Center Activities Building (4641	0	0	0
2005	GSFC/WFF	23 Family Housing Units	750	0	750
2005		FP&D	1,320	0	1,320
2005	GRC	*Demolish Water Towers, Plum Brook Station	0	0	0
2005	KSC	Schwartz rd-old protype facility	500	0	500
2005	JSC	Demolish Thrust blocks (353) 2	0	0	0
2005	JSC	Demolish Support Office Building (265) North Side	470	0	470
2005	JSC	Demolish Steam System (353) PART 2	0	0	0
2005	JSC	Demolish Surface Impoundment (358)	0	0	0
2005	JSC	Demolish Laydown Yards	600	0	600
2005	JSC	Demolish Blast Panels (353)	20	0	20
2005	JSC	Demolish Underground Oxidizer Tank (353)	45	0	45
2005	JSC	Demolish Oxidizer Burn Tower (356)	65	0	65

FY	Center	Project Name	Demolition Cost ($000)	Other Funds ($000)	Total Cost ($000)
2005	JSC	Demolish Burn Pit (356)	40	0	40
2005	GRC	Demolition of Abandoned Sewer Pump House No. B26	0	0	0
2005	SSC	Building 3203 Derrick Crane - abandoned	0	0	0
2005	SSC	Building 2436 (portions)	25	0	25
2005	SSC	Building 4120 Auxiliary Derrick Crane -	50	0	50
2005	SSC	Building 4122 Auxiliary Derrick Crane -	50	0	50
2005	SSC	Building 4400 Co-lateral Equipment	600	0	600
2005	SSC	Railroad Tracks 007	175	0	175
2005	JSC	Demolish Building 353 Steam System PART 1	0	0	0
2005	JSC	Demolish Support Office Building 265 South Side	0	0	0
2005	MSFC	Atmospheric Research (4614)	0	0	0
2005	JSC	Demolish Miscellaneous Roads and Concrete Structures	550	0	550
FY05 Total					10,000
2006	MSFC	Demolish Center Activities Building (4641)	25	0	25
2006	MSFC	Demolish Center Activities Building (4642)	28	0	28
2006	GRC	Demolition of Abandoned Sewer Pump House No. B26	259	0	259
2006	GRC	Demolish Altitude Wind Tunnel Complex	3,000	0	3,000
2006	GRC	Demolish Altitude Chambers, Propulsion System Lab (PSL) Cells 1 & 2, Bldgs. 65/66	2,000	0	2,000
2006	GSFC/WFF	F-027 Paper Shredder Facility	0	0	0
2006	GSFC/WFF	F-211 Storage Building	0	0	0
2006	GSFC/WFF	F-023 Water Pump House	0	0	0
2006	GSFC/WFF	H-114 Water Pump House	0	0	0
2006	GSFC/WFF	M-003 Bunkers	0	0	0
2006	GSFC/WFF	M-004 Bunkers	0	0	0
2006	GSFC/WFF	M-005 Bunkers	0	0	0
2006	GSFC/WFF	M-006 Bunkers	0	0	0
2006	GSFC/WFF	V-070 Observation Tower	10	0	10
2006	GSFC/WFF	W-025 POMB Maint Mat Storage	13	0	13
2006	GSFC/WFF	Y-036 Firing Cubicle	0	0	0
2006	GSFC/WFF	Y-037ALaunch Complex Fire Cub #2	0	0	0
2006	GSFC/WFF	Y-038A Launch Fire Control Center	3	0	3

FY	Center	Project Name	Demolition Cost ($000)	Other Funds ($000)	Total Cost ($000)
2006	GSFC/WFF	Y-064 Electricsl Distribution Center	14	0	14
2006	GSFC/WFF	Z-042 Launch Pad Terminal Building	15	0	15
2006	GSFC/WFF	A-027 Target Practice Gun Range	3	0	3
2006	GSFC/WFF	X-105 POMB Materials Storage	15	0	15
2006	GSFC/WFF	V-026 Rocket Build up Payload Processing	17	0	17
2006	GSFC/WFF	V-130 Wooden Tower	10	0	10
2006	GSFC/WFF	F-008 Logistics	325	0	325
2006	GSFC/WFF	W-096 Assy & Checkout Mobile Shelter	100	0	100
2006	GRC	Demolish Building No. 24, Northern Section		0	
2006	ARC	N218 14 FT. Wind Tunnel (Test Chamber Bldg.)	2,000	0	2,000
2006		FP&D	513	0	513
2006	KSC	Hangar L (1732, 54906, 60425)	530	0	530
2006	JSC	Demolish Thrust blocks (353) 1	45	0	45
2006	JSC	Demolish Above ground and below Propellant tanks including Oxidizer Burn tank and Fuel Burn tank. (356)	150	0	150
2006	JSC	Demolish Abandoned Water Well 3 (303) and Lift Stations	55	0	55
2006	KSC	TR1-623 Coastal building sys	4	0	4
2006	KSC	TR1-597 Southern	4	0	4
2006	KSC	TR1-610 Boxcar	16	0	16
2006	KSC	TR1-607 Temporary building	4	0	4
2006	KSC	TR1-718 T&R custom	4	0	4
2006	KSC	TR1-730 Triple custom trailer	4	0	4
2006	KSC	TR1-740 Coastal building sys (trailer)	4	0	4
2006	KSC	TR1-474 Boxcar	15	0	15
2006	KSC	TR1-487 King's Custom	3	0	3
2006	KSC	TR1-591 Southern	4	0	4
2006	KSC	TR1-704 Coastal building sys (trailer)	5	0	5
2006	KSC	TR1-712 Boxcar	15	0	15
2006	KSC	TR1-741 Trailer	3	0	3
2006	KSC	TRM-003 Temp building #52 (2T)	10	0	10
2006	KSC	TRM-005 Temp building #15 (4T)	17	0	17
2006	KSC	TRM-019 Temp building #36 (2T)	42	0	42

FY	Center	Project Name	Demolition Cost ($000)	Other Funds ($000)	Total Cost ($000)
2006	KSC	TRM-033 Temp building #52 (2T)	10	0	10
2006	KSC	TR1-724 Coastal building sys	3	0	3
2006	KSC	TRM-032 Temp building #51 (5T)	20	0	20
2006	KSC	TRM-050 Temp building #71 (2T)	8	0	8
2006	KSC	Hangar Little L (60505)	0	0	0
2006	KSC	Schwartz rd-old protype facility	0	0	0
2006	MSFC	Storage Building (4651)	0	0	0
FY06 Total					10,000
2007	KSC	SAEF No. 2	691	0	691
2007	LaRC	Demolish Impact Dynamic Test Facility Complex, Buildings 1297,1297A thruG	3,670	0	3,670
2007	LaRC	Demolish Building 640 Transonic Pressure Tunnel	1,300	0	1,300
2007	LaRC	Demolish Building 641 8-Ft High Speed Tunnel	330	0	330
2007	LaRC	Demolish 16-Ft. Transonic Tunnel Complex, Buildings 1146,1146A-C, and 1146G-M	2,300	0	2,300
2007	GRC	Demolish Logistics Management Building No. 28	1,400		
2007	GSFC/WFF	W-100 Scout Utility Building	70	0	70
2007	GSFC/WFF	W-126 Trailer Shelter	6	0	6
2007	KSC	TRM-047 Temp building #66 (2T)	21	0	21
2007	KSC	TR1-755 TBD	3	0	3
2007	KSC	TRM-018 Temp building #29 (2T)	9	0	9
2007	MSFC	Materials & Process Lab (4612)	0	0	0
2007	MSFC	Storage Building (4617)	0	0	0
FY07 Total					8,600
2008	GSFC/WFF	Y-067 Radar Support Cubicle	2	0	2
2008	GSFC/WFF	W-105 Winch Shelter	10	0	10
2008	GSFC/WFF	W-110 Guard House	2	0	2
2008	GSFC/WFF	W-116 Service and Storage	4	0	4
2008	GSFC/WFF	W-125 Scout Launcher Service	5	0	5
2008	GSFC/WFF	W-128 Environmental Control	6	0	6
2008	GSFC/WFF	Y-060 Island Radar control	110	0	110
2008	GSFC/WFF	Y-050 Storage	20	0	20

FY	Center	Project Name	Demolition Cost ($000)	Other Funds ($000)	Total Cost ($000)
2008	GSFC/WFF	E-108 Engineering Lab		200	
2008	JSC	Demolish Surface Impoundment (358)	700	0	700
2008	MSFC/MAF	Building 111 Phase 1 (asbestos abatement)	2,300	0	2,300
2008	MSFC	Development Process Facility (4711)	887	0	887
FY08					9,946
2009	GSFC/WFF	Z-041 NSWC Performance Test Facility	350	0	350
2009	MSFC	Demolish Propulsion System Test Stand (4514)	100	0	100
2009	MSFC	Demolish Transient Pressure Test Facility (4515)	250	0	250
2009	MSFC	Demolish Fuel Storage Facility (4594)	100	0	100
9	MSFC/MAF	Building 111 Phase 2	3,900	0	3,900
FY09					8,920
FY04 – FY09 Total					**58,066**